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EFFECTS OF CORPORATE SIZE ON EFFICIENCY AND PROFITABILITY

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PREFACE

Writers in economics and finance have set forth the advantages of large-scale production while, at the same time and without any particular limitations, they have repeated the generally accepted proposition that corporations of medium size are both more efficient and more profitable than either small or large businesses. The assumption is that the small firms have not gained the advantages of mass production, whereas the large enterprises are presumed to have expanded beyond their optimum efficiency and profitability.

Such an unqualified explanation leads to oversimplified, if not indeed inaccurate, conclusions with respect to a very complex condition. This study is designed to coordinate and analyze critically the materials available on the relative efficiency and profitability of corporations of different size.

Large-scale enterprise has been under attack for many years because of its allegedly monopolistic practices. In addition, it has more recently been accused of being relatively inefficient and unprofitable. Without further investigation of the data currently available or the acquisition of more complete figures, the Federal Trade Commission and the Department of Justice appear to be quite willing, and perhaps anxious, to force a reduction in the size of many multiple-unit corporations.

Regardless of the merits of the perennial argument about an inevitable causal relationship between bigness and monopoly, a study of the question of relative efficiency and profitability is obviously of economic and social significance. Unfortunately, a considerable proportion of the literature in the field reflects either a vested interest in big business or an enthusiasm for small enterprise and atomistic competition instead of representing an attempt at scientific analysis.

A major portion of the chapters on efficiency was published by the author in a separate article entitled, "The Relative Efficiency of Large, Medium-Sized, and Small Business," *Accounting Review,* July, 1950. Permission has been granted by that publication for the inclusion of those materials in this study.

RICHARDS C. OSBORN

July, 1950

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I. INTRODUCTION

"Large business is unprofitable, it is inefficient, and there is no reason why these large units should not be broken up. The result will be greater efficiency for all business and profits will be increased."

The philosophy expressed in this statement appears to characterize the attitude of the Federal Trade Commission. Moreover, it permeates various other agencies of the Federal government and is prevalent in certain academic circles.

This study investigates and analyzes the data which are available on the subject of efficiency and profitability in relation to size; it attempts to determine the adequacy of the foundation on which assertions such as those paraphrased in the introductory statement have been based, as well as the validity of the statement itself. Such an analysis must necessarily be limited to objective material and will not enter into an extensive discussion of the social and economic evils usually associated with, and often attributed to, monopoly and/or big business. No attempt will be made to evaluate the proposition that large-scale business necessarily results in a power and monopoly position which is so antisocial that a reduction in size is warranted, regardless of the possible outcome for efficiency and profitability.[1] Such matters can be settled satisfactorily only after long investigation and involve complex analyses of broad social policy.

Recent Origin of Analysis on Efficiency and Profitability

In order to give a proper perspective to the question of efficiency and profitability in relation to size, it is appropriate to comment very briefly on the historical development of the problem. Small-scale business and a few larger firms were active prior to the Civil War, but the great development of mass production and the rise of giant corporations stem from the period after 1865. With the impetus of new techniques and a mass market, the advantages of production on an ever-expanding scale became evident; the size of individual corporate enterprises increased rapidly, both through internal growth and by external combination. Economists extolled the advantages of large-scale production and pointed out the ways in which economies could result when business was conducted on a huge scale. Savings could be made in purchasing, production, selling, and administrative costs, while competition was assumed to be sufficient to assure that these reduced costs would be accompanied by lower selling prices for manufactured goods. It was not clearly apparent at first that an increase in the size of the business unit would almost inevitably lead to a combination of such units into an organization that would lessen competition. A philosophy of bigness, with commensurate benefit to all, seemed to be prevalent.

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[1] A forceful presentation of the view that business enterprises should be limited to a certain maximum size is found in Fred I. Raymond, *The Limitist* (New York: W. W. Norton & Company, Inc., 1947).

As it became evident that combinations were not expressing a public spirit, protection was sought through the passage of antitrust legislation. Little question was raised, however, concerning either the efficiency or the profitability of the trusts.[2] With few exceptions (e.g., those found in the early writings of the late Justice Brandeis), only the social consequences were emphasized as major reasons for limiting size; the courts, for example, were not primarily concerned with the economic waste which might result from combinations which were uneconomic in character.

There were some exceptions to this general social criticism, an example being found in the study on reorganizations by Arthur Stone Dewing,[3] which illustrated the ease with which unsuccessful combinations could be promoted when profits of promotion and hopes for monopolistic exploitation outran economic justification.

Prior to the first World War, however, there were no extensive studies on either the efficiency or the profitability of business in relation to the size of the business unit. Even if comparisons had been desired, the data available were clearly inadequate for the purpose. Nor is it surprising that, at a time when historically increasing returns were so evident in industry, little interest was expressed in the waste arising from consolidation.

Present Significance of the Problem

Now that the Federal Trade Commission and the Department of Justice have become more active in their attack upon big business, it seems particularly appropriate to analyze the relative efficiency of large-scale enterprise. The existence of this efficiency has been accepted by certain business groups and set forth as one if not the major justification for the continuance of such large corporations, whereas evidence to the contrary has been seized upon, at times enthusiastically and rather uncritically, as sufficient reason for demolishing the giants.[4]

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[2] E.g., Jeremiah W. Jenks, *The Trust Business* (New York: Doubleday, Page & Company, 1903).

[3] *Corporate Promotions and Reorganizations* (Cambridge: Harvard University Press, 1914).

[4] Kemper Simpson, *Big Business, Efficiency and Fascism* (New York: Harper & Brothers Publishers, 1941), p. 29. The author states: "If the great corporations

Would it not be wise to re-examine the data available on the subject and, if they are not adequate, to acquire sufficient material to provide a basis for future policy determination?[5] If the evils of bigness are so great and so inevitable as to make necessary a reduction in size, then we should at least know what is being given up — or gained — in efficiency and otherwise.

The question of profitability in relation to size has been injected into this debate principally because the largest firms have appeared to be less profitable than the medium-sized ones and because of the mistaken concept that, in the absence of more complete cost data, the profitableness of different-sized corporations can be used as a reasonably adequate measure of relative efficiency.

Scope of the Study

Although over-all profits by size of firm are discussed briefly in this study, the primary emphasis is placed on the relative efficiency and profitability of manufacturing corporations of differing size, with little or no attention devoted to the other two main categories of large-scale business: that is, the public utilities, including railroads, and the financial companies, including insurance and real estate. Trading enterprises have also been excluded from consideration since only 38 of them had assets in excess of $50 million, thus making the numbers in the subclassifications very small. Of the 994 corporations with assets of more than $50 million each that filed income tax returns for 1946, a total of 217 were manufacturing; 206, public utility; and 511, finance, insurance, and real estate enterprises.

There are two major reasons for this limitation of scope. First, data

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are not more efficient than their medium-sized competitors, what possible excuse can there be for not breaking them up into medium-sized units? Why should democracy not use all its power and vigilance to force the corporations in the same industry to compete in reality rather than in appearance? Would it be going too far to insist that no stockholder of one of a group of dissolved corporations should be allowed to hold stock in another of these corporations?"

[5] Corwin Edwards is one of the group which admits that there is a great scarcity of valid statistics as to relative efficiency, but he would put the burden of proof on the large corporation to justify its continued existence. In the meantime he would not wait for the figures which he considers to be unnecessary since:

"Obviously, if business concentration were brought down to a scale appropriate to modern technology, our large business units would be much smaller than they are today, and many of our monopoly problems would be reduced or ended.

". . . even if every plausible claim to preserve bigness on grounds of efficiency should be granted, the concentration of economic power would be decidedly less than it is now. It is probable that without impairment of efficiency we could end many of our industrial monopolies and greatly reduce the power of our conglomerate business giants." *Maintaining Competition, Requisites of a Governmental Policy* (New York: McGraw-Hill, Inc., 1949), pp. 113, 120.

on efficiency in terms of size are available for only the manufacturing segment of business. Second, this is the type of firm about which current discussion hinges. The public utilities are regulated enterprises, as to whose operational size in relation to efficiency or profitability there has been no special argument; rather, their financial control and manipulation have been attacked.

In any event, no comparisons have been made between results before and after demolition of the larger holding company systems under the application of the Public Utility Holding Company Act. The financial institutions are in a separate category of business which has received low average returns and has not been subjected to recent public criticism on matters within the scope of this study.

Because of the manner in which the statistics are compiled, the analysis is limited to corporations, which in the manufacturing field represent slightly more than one-half of the firms but produce approximately 93 percent of the value of product.

Treatment will be accorded the effect of the business cycle on income and no-income corporations in relation to size of assets. The relationship of size to variations in other factors, namely, stability and dispersion of income, business failures, capital costs and capital turnover, and significance of officers' compensation will be discussed.

The concluding chapter will present certain observations on the subject of bigness versus smallness, in addition to the specific conclusions.

II. MEANING AND MEASUREMENT OF EFFICIENCY

Meaning of Efficiency

Efficiency is defined in the dictionary as the "capacity to produce desired results by a calculated adjustment of means to an end." Such a definition permits two approaches to the subject, one from the broad social point of view and the other from the usual business and economic point of view, which has been defined as "the effective operation of a business, or performance of a business task, with a minimum of waste effort."

An attempt at the broader approach to efficiency was made by Dr. Theodore J. Kreps in his appraisal of the measurable aims of business as: maximum consumption, maximum payrolls, minimum cost (to consumers), maximum employment, and full utilization of capacity.[6] He stated:

> Business is not merely nor even in the first instance a struggle of individuals for wealth. It is a way of life, a system of providing goods and services. Private enterprise, like public organization and other forms of enterprise, justifies itself only insofar as it provides the American people with the highest possible level of consumption or standard of living. Any practice that restricts production, keeps up prices to consumers, or keeps down wages and other forms of mass income is contrary to the charter under which business receives public protection and approval. The acid test of business is not the profit-and-loss statement but the social audit.[7]

He admitted the difficulty of finding adequate quantitative measurements in general and the further difficulty of applying them to industries as a whole or to individual businesses. Furthermore, there has been no agreement as to the degree to which the six measures actually applied — namely, employment, production, consumer effort commanded, consumer funds absorbed, payrolls, and dividends and interest — actually measured social performance.[8] But regardless of the possible merits of this approach, which emphasizes the importance of maintaining full employment and adequate purchasing power, data are not available for this type of study by different size-groups.

A half-hearted effort was made to measure general or over-all efficiency of war contractors during the war, since one of the factors to be considered by the price adjustment boards in the recovery of excessive profits was the "efficiency of contractor, with particular regard to attainment of quantity and quality production, reduction of costs, and economy in the use of materials, facilities and manpower."[9] Because of the impossibility of making a comparative analysis of firms even in the same area and competing field, the matter of efficiency was given little more than lip service in the renegotiation reports.

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[6] T.N.E.C. Monograph No. 7, *Measurement of Social Performance of Business.*

[7] *Ibid.*, p. 2.

[8] For a sharp criticism of this monograph, see John Scoville and Noel Sargent, *Fact and Fancy in the T.N.E.C. Monographs* (New York: National Association of Manufacturers, 1942), pp. 89-112.

In this study the second and more commonly employed cost definition of the term "efficiency" will be employed; for only in this sense has there been any attempt to measure efficiency in relation to size. As an economic term, efficiency must necessarily be related to cost of producing specific products by the individual plant or firm, and that business is to be considered most efficient which has the ability to produce and market goods or services at the lowest cost possible under the environmental circumstances facing the management.

Differentiation Between Efficiency and Profitability

Efficiency should be clearly differentiated from profitability. The former is measured by cost, whereas the latter is ordinarily considered to be the rate of return either on total investment or on the equity segment, that is, net worth. Since the various studies of cost have been neither so extensive nor so complete as analyses of return on net worth, the latter have often been employed as though they were valid measures of efficiency. Under certain circumstances the return on net worth might be so used, but it ordinarily involves too many varied factors which are not directly related to efficiency. Moreover, profit is a residual sum and its size is sometimes far more dependent on other factors than on relative unit costs. Only under exceptional conditions in which selling prices are equal and products sold are practically identical could return on capital investment be considered even a moderately valid measure of operating efficiency.

The difference between efficiency and profitability is illustrated by a study of the Federal Trade Commission on wartime costs and profits in the steel industry, which showed that, although the largest and most fully integrated companies had by far the lowest accounting costs, the medium-sized firms were the most profitable in terms of return on net worth.[10] In fact, some of the companies with highest costs also had the highest rates of return, since they had a very low capital investment and a high capital turnover. How the results would appear if return on investment were included as a cost is not known and, in any event, would depend in part on what was considered a fair percentage rate of return to be included in that cost.

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[9] Renegotiation Act of 1943.

[10] *Wartime Profits and Costs of the Steel Industry* (Washington: Federal Trade Commission, 1925).

And yet, to some degree, the profitability of a business does measure the efficiency of a business from the point of view of the stockholders. It indicates the degree to which the firm has been able to compete successfully under whatever conditions of competition existed in the industry. This approach, however, gives to efficiency a considerably different meaning from that related solely to cost.

Measurement of Efficiency

Once a definition of efficiency, using cost as the measure, is accepted the question will be raised immediately as to what is included in cost, and it is evident that the answer on this point is of crucial importance.[11] Is return on investment to be included and, if so, at what rate on what investment base? Are costs to be accounting book costs or adjusted costs? How are allowances for differences in external conditions to be calculated? Such important questions should be determined as a starting point, but they have never been answered in connection with the studies which have been published as evidence of relative efficiency. Most investigations have been based solely on findings with respect to relative costs, without adjustments of any sort.

It should be quite obvious that comparability as to external circumstances is of primary significance. When businesses are operating under such conditions it is reasonable to conclude that the one with the lowest cost is the most efficient.[12] This low cost, however, is significant only if continued for a period of years, so that it is clearly based on efficiency of actual operation rather than on some unusually fortunate circumstance or accounting adjustment. Comparisons then made by size of firm would have some significance, although there would doubtless always be disagreement among interested groups.[13]

What are the factors which tend to make cost comparisons difficult even after the meanings of cost and efficiency are agreed upon? First, costs must be calculated per unit of comparable product. This is difficult not only because different companies or plants produce slightly varying products but also because many firms produce a variety of products. Some may be high-cost and some low-cost. In any event, the cost of each is dependent upon accounting methods and the allocation of overhead costs, on which opinion will vary even — or especially — among experts.

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[11] For a discussion of some of the more theoretical aspects of this question, see C. Reinold Noyes, "Certain Problems in the Empirical Study of Costs," *American Economic Review* 31:473-492 (September, 1941).

[12] Even then we are merely assuming that the most efficient management is as effective as it is capable of being in terms of costs, types of products manufactured, etc.

[13] It is sometimes maintained, for example, that, once a company has reached a size sufficient to gain the advantages of mass production, the efficiency of the management is the major determining element in relative cost. See Scoville and Sargent, *op. cit.*, p. 195.

Second, such variables as geographical location, wage rates, skill of labor, price level at time of plant construction, excess capacity, movements of population, and numerous other factors will affect the cost of production of a particular company, in both the short and the long run. Currently, the change in price levels has made especially significant the differences in depreciation on prewar as compared with postwar construction.

It is possible to adjust calculations, at least partially, for geographic variations in cost, such as wages, by comparing companies of different size in the same area. But no very satisfactory methods have been devised with respect to differences in operating capacity and certain other factors beyond control of the management, or to eliminate temporary fluctuations in costs by comparing such costs over an extended period of time. In the majority of cost studies, moreover, no such important adjustments have been made in the figures collected.

An illustration of the complexity of the analysis necessary for adequate treatment of costs can be afforded by the case of wage differentials. Of the several elements which enter into the cost of a product, the wage rate paid for labor is a most significant item. In so far as wages may vary among companies, that fact sometimes provides a plausible explanation for differences in costs among those companies. Wide variations in wages for a single industry are found for different geographical areas. Plants which are located in the South, for instance, often (but not always) have lower wage rates than those elsewhere, regardless of the size of plant or company. Their costs will therefore be lower than those for comparable companies with plants in higher-cost areas; and this is true in all size classifications. The size of the locality is also of significance. Higher wages are paid in larger towns than in smaller localities. To a lesser degree, other elements of cost are likely to be more expensive in certain geographical locations and in the larger cities.

Wages are higher in union than in nonunion plants, and the total pay per worker is usually greater in shops which employ incentive plans than in plants which utilize a straight-time plan.

All these factors must be neutralized before it can be determined whether or not the wages paid by firms of different size will show significant differences. Even in such an event, there is no certainty whether the higher wages paid will or will not be offset by increased efficiency resulting from the higher wages. Therefore, it is not clear which differences in wages should be added to and which deducted from stated costs in the measurement of relative efficiency.

Data on this subject are somewhat meager but appear to indicate that the companies of larger size pay definitely higher wages in those industries in which the ownership is concentrated to a high degree, but that this difference tends to disappear in those industries in which there is little domination of the field by a small number of corporations. Since the hours of work are shorter for the larger than for the smaller firms, the difference, classified by size of firm, between the weekly wages is less than the difference in the hourly wages. This difference in wages paid as among companies of different size does not seem to be so apparent among plants of different size, if variable factors have been adjusted.

According to a statement before the Temporary National Economic Committee:

> Workers at the same job in the meat-packing, iron and steel, and electrical-goods industries and in the manufacture of radio sets, explosives, soaps, fertilizers, and chewing and smoking tobacco and snuff had higher hourly earnings when employed by one of the biggest concerns in their industry than when working for a smaller company. This difference was not a function of region, size of community, or size of establishment, and could not be explained by unionization.
>
> On the other hand, there was no relation between the size of the average hourly earnings and the size of company in the shoe, leather, cotton goods, woolen and worsted goods, hosiery, knitted underwear and outerwear, radio parts and tubes, and furniture industries. Thus, size of company appears to be a significant factor only in those industries in which a substantial share of the total business is done by a few companies, not in the industries in which ownership is more widely diffused.
>
> In very few of these industries were there clear differences between the average hourly earnings of employees in plants of different sizes. An exception appears to be provided by bituminous coal mines.[14]

It therefore appears that larger corporations in general pay higher average dollar wages than smaller corporations but that, except for those fields in which ownership is concentrated, the explanation is found in the fact that such companies have the majority of their plants located in higher-cost geographical areas and in large cities, they have more extensive unionization, and they depend to a greater extent on incentive programs. These latter features explain the wage differentials more often than does the size of the company.

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[14] T.N.E.C. Monograph No. 14, *Hourly Earnings of Employees in Large and Small Enterprises* (1940), pp. xi-xii.

In any comparison of cost as a measure of efficiency, such higher wages, which are due to factors other than size of firm, would need to be accounted for. No such adjustment has been made in any of the cost data which have been published, although the geographical adjustment is made automatically when the only companies compared are all in a given area. Since these variations in wages are sometimes greater than average cost differences for companies of different size, it would appear that, in many instances, the larger companies may have this extra factor loaded onto their costs.

In spite of such unsolved problems connected with the question of efficiency, various investigations have been made of comparative costs for plants and firms of differing size. The data used and the diversely opposing conclusions reached would seem to raise considerable doubt as to the adequacy of our present knowledge. Nor is the issue clarified much by the numerous statements and a priori reasoning with respect to the assumed advantages or disadvantages of large-scale enterprise.

III. ANALYSIS OF STUDIES ON EFFICIENCY

Aside from the comments of the preceding chapter on the difficulties of measuring efficiency it does not seem appropriate to set forth at greater length the requirements for a valid study of comparative efficiency. No purpose can be served by setting up a straw man to be picked to pieces. This is especially evident since the following studies, which are the major ones published, have not been adjusted as required for adequate comparison.

T.N.E.C. Report No. 13

The most extensive compilation of differences in cost as related to the size of plant or company was made by the Federal Trade Commission for the Temporary National Economic Committee. Data used by the Commission did not involve any new investigation but comprised primarily an assembly from its own files and those of the Tariff Commission of the studies on variations in cost which had been collected over a period of years. Cost and return on investment were the two tests of business efficiency utilized, since:

> In the final analysis, efficiency in business means ability to produce and distribute goods at the lowest possible cost. The cost of producing a unit of product is perhaps the most important single test of business efficiency. Due to the inability to secure separate data on distribution costs, the rate of return on invested capital has been used as the second criterion.[15]

Comparisons were made by companies, by plants individually, and by groups. The studies covered varying periods of years and widely diversified groups of enterprises, although many of the best related to only a one-year comparison.

Selection of the industries covered was based on availability of data. Included were cost studies in cement, blast furnaces, steel mills, farm machinery, petroleum production, petroleum refining, beet-sugar production, cane-sugar production, sugar refining, milk distribution, butter, canned milk, flour milling, and baking. In addition the Commission included rates of return on invested capital for the motor vehicle, chemical, fertilizer, and rayon industries.

The method employed by the Commission in measuring relative efficiency was a peculiar one. Instead of using a correlation procedure or ascertaining the average cost or trend by size groups, it listed plants or companies in rank based on individual plant or company cost. This method, an illustration of which is afforded in Table 1, was used

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[15] T.N.E.C. Monograph No. 13, *Relative Efficiency of Large, Medium-Sized, and Small Business* (1941), p. 3. Only the cost studies will be discussed in this section.

TABLE 1.—BOOK FURNACE COSTS OF BASIC PIG IRON (NORTHERN FURNACES) IN 1910 FOR DIFFERENT SIZES OF PLANTS OF THE U. S. STEEL CORPORATION, ARRANGED IN ORDER OF ASCENDING COSTS

Plants classified by volume of production	Furnace cost per gross ton
1. Medium	$11.94
2. Very small	12.14
3. Large	12.41
4. Small	12.59
5. Small	13.06
6. Small	13.13
7. Large	13.21
8. Very small	13.38
9. Medium	13.78
10. Very small	13.94
11. Small	14 06
12. Large	14.22
13. Very small	14.42
14. Very small	14 63
15. Very small	15.70
Average, fifteen plants	$13.20

Source: T.N.E.C. Monograph No. 13, p. 26 (originally taken from data collected by the Bureau of Corporations).

COMMENTS ON TABLE 1

(a) Lowest cost plant was medium in size.

(b) Of the three large plants, one had a fairly low cost, one had an average cost, and one had a rather high cost.

separately or combined with average-cost calculations for all industries covered by the cost data.

In only a few cases did the largest plant or company rank at the top of any classification, as seen in the following results for individual company-cost tests:

In but 1 of the 59 individual company-cost tests did the largest company have the lowest cost.

In 21 of these 59 tests, a company classified as medium-sized had the lowest cost.

In 37 of these 59 tests, a company classified as small had the lowest cost.

Of particular significance is the fact that in these 59 tests, on the average, over one-third of the companies in every array had costs lower than that of the largest company.[16]

From these and similar tabulations for individual plant-costs, group plant-costs, and rates of return on invested capital it was concluded that, "The results of the total tests reveal that the largest companies made, on the whole, a very poor showing."[17]

Let us examine first the extent to which the Federal Trade Commission fulfilled the requirements necessary for valid cost studies. Instead of attempting to remove those factors other than size which might have influenced the results, it minimized and subsequently ignored their importance, stating that:

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[16] *Ibid.*, p. 12.

[17] *Ibid.*, p. 10.

> In industry there are many factors which may account for the lower costs of one concern in comparison with another, or the higher rate of return of one industrial unit as compared with another. Such factors as location, degree of mechanization, degree of operating capacity, sex of labor, skill of labor, wages, and accidental condition such as strikes, floods, storms, shifting centers of population, depletion of natural resources, climate and other influences may critically affect at any one time costs of production and rates of return of particular plants and companies. Whether size and size alone, rather than other factors, happens to explain the more effective performance of companies and plants classified as medium-sized or small in the tests conducted by the Commission cannot be definitely determined. But the Commission believes that there may be considerable warrant for the conclusion that the factor of size may well have been a very significant influence in the results of the tests.[18]

Thus, the existence of factors other than size, such as geographical differences, was recognized but virtually ignored except in those few cases of cost comparisons which could be made within each region.

The Commission differentiated two sets of factors: those over which the management had no control, such as shifts in centers of population, exhaustion of natural resources, and government policies; and those factors under control of the management, such as degree of mechanization, location of plants, and effectiveness in utilizing full operating capacity. The influence of the first set of factors was waved aside with the statement: "It would be unreasonable to assume that the more effective performance of medium-sized and small business units in many industries could be solely the result of factors which lay beyond the control of management. Such factors are likely to affect all enterprises, regardless of size, and are not likely to be statistically biased in favor of any one size classification as against another."[19]

Variations in wage scale were relatively unimportant, since "It appears from the existing data that medium size or small size as often pay better wages than large size corporations."[20]

Differences in percentage of capacity utilized were not deemed significant under the circumstances, since, "Considering the quantity of the tests and the variety of time periods which they cover, it would seem reasonable to conclude that if large size was so invariably handicapped by low operating ratios, such operating ratios were in turn a

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[18] *Ibid.*, pp. 17-18.
[19] *Ibid.*, p. 18.
[20] *Ibid.*, p. 18.

TABLE 2.—COSTS OF CEMENT PLANTS IN THE SOUTHEASTERN SECTION IN 1929, ARRANGED IN ORDER OF ASCENDING COST PER BARREL

Type of company	Percent of capacity utilized	Cost per barrel
1. Independent	100	$1.14
2. Big Five	55	1.15
3. Big Five	61	1.18
4. Independent	68	1.19
5. Independent	46	1.23
6. Big Five	53	1.34
7. Big Five	67	1.41
8. Big Five	48	1.42
9. Big Five	87	1.63
10. Independent	49	1.65

Source: T.N.E.C. Monograph No. 13, p. 25 (originally taken from the files of the United States Tariff Commission).

COMMENTS ON TABLE 2

(a) In the Southeastern section the lowest-cost mill was fairly small and belonged to a small company.

(b) Certain Big-Five mills, belonging to one of the large companies, had rather high costs.

serious indication of inefficient operation, involving the burdening of the corporations with the unused capacity."[21]

Thus, although the Federal Trade Commission indicated, and studies have shown,[22] that utilization of capacity is an important consideration in determining cost, no allowance was made for such differences. It was possible, therefore, to reach the ridiculous conclusion, shown in Table 2, that a small plant operating at full capacity in 1929, with a cost per barrel of cement of $1.14, was more efficient than one operating at 55 percent of capacity and having an average cost per barrel of $1.15. Even a cursory glance at the figures shows the evident absurdity of such a position.

The Federal Trade Commission, however, looked upon the tests of efficiency adopted in its inquiry as the "best available scientific tests," and showed obvious delight in the outcome of the study. On the other hand, the Commission was reluctant to assert that the results proved conclusively the relative inefficiency of large-scale enterprise, even though it expressed little doubt about the methods used or the conclusions reached, stating:

> The Commission in submitting the results of these tests to the Temporary National Economic Committee offers no definite opinion as to whether they conclusively disprove the claim frequently made that large size in American business is more efficient than medium size or small size. But the Commission does believe that in transmitting the results of these tests to

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[21] *Ibid.*, p. 20.

[22] T.N.E.C. Hearings, Part 26, p. 13777. This analysis shows the differences in cost of production of steel by the United States Steel Corporation at varying levels of operation.

> the Committee it is contributing information concerning the efficiency of size, which is of large public interest and of service to the Committee.
>
> The Commission is of the opinion that the data which it has here assembled are in many respects more comprehensive and detailed than those in any previous study of this problem. For this reason alone the Commission considers that the study is an important contribution to this field of economic inquiry. Whether the results of the tests conducted by the Commission cast serious doubt on the superior efficiency of large size in American business must be left to the judgment of the Committee.[23]

Perhaps the best illustration of the bias which colored the handling of the data, and the conclusions drawn therefrom, is found in the attitude of Kemper Simpson, who directed "the compilation and interpretation of the basic data" and "helped prepare the Federal Trade Commission's report."[24] He accepted enthusiastically and uncritically all of the material presented in the monograph, concluding that it had been proved beyond reasonable doubt that large-scale enterprise, in addition to being guilty of the major misdemeanors charged against it, is both less efficient and less profitable than small and medium-sized business. The growth of large firms is to be explained, therefore, almost entirely in terms of financial power and the exploitative practices used to hinder competitors. Thus the giants are considered to be not only uneconomic but a significant threat to the whole democratic system.

Unfortunately, the general attitude expressed by Mr. Simpson would seem to indicate that his conclusions had been reached in advance of his analysis of efficiency, and that the statistics conveniently verified a previous conclusion. Thus, as a basic premise, large businesses are an evil and should be reduced in size, regardless of their efficiency. The showing of inefficiency merely wipes out the sole remaining basis for their existence.

The methods used by the Federal Trade Commission and the conclusions reached by that agency have been subjected to rather caustic criticism on the basis of the adequacy of the tests, the adequacy of the samples, the classification of companies, the analysis of the tests, and the general conclusions reached.[25]

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[23] T.N.E.C. Monograph No. 13, p. 11.

[24] *Op. cit.*, p. 43.

[25] Scoville and Sargent, *op. cit.*, pp. 190-200. See also Robert N. Anthony, "Effect of Size on Efficiency," *Harvard Business Review* 20:290-306 (Spring, 1942); and Joe S. Bain, "Price and Production Policies," *A Survey of Contemporary Economics*, Howard S. Ellis, Ed. (Philadelphia: The Blakiston Company, 1948), p. 141. "Some of the principal shortcomings of this work involve the use of insufficiently rectified accounting costs as basic data, and the nonrecognition of differences other than those in scale of plant as the probable causes of the noted differences in average costs among plants of various sizes."

Furthermore, "a re-examination of the original data used by the Commission relating to unit costs and size of plant indicates that the relationship between costs and size is quite different from that described by the Commission; large plants generally tend to be more, rather than less, efficient than medium-sized and small plants."[26] In other words, when costs for businesses of different size are averaged, rather than treated on an individual-firm basis, they show that there are certain industries in which the largest units have the lowest costs of any group.

Such an extended treatment of T.N.E.C. Monograph No. 13 is clearly not warranted by its quality, and would be unnecessary if it were not the most extensive of the analyses of efficiency in relation to size and had not been quoted so widely as proof of the relative inefficiency of large-scale enterprise.[27]

Costs in the Iron and Steel Industry

Although there are no recently published figures for the steel industry which compare costs by size of plant or firm, the Commissioner of Corporations did publish data for 1910 which compared the average furnace costs for plants of different size owned by the United States Steel Corporation. This was done for Bessemer and basic pig iron and for both Bessemer billet ingots and basic open-hearth ingots. The larger plants showed the lowest costs in all four types of production, the first two of which are illustrated in Table 3.

As with most similar cost data, certain variables complicate the figures. Southern plants were excluded since their low operating costs were due principally to geographic factors, although their delivered costs were higher than those for firms north of the Ohio River when transportation northward was included in cost. Analysis of costs by districts in the North showed a greater variation in average costs as between the highest and lowest cost areas than the difference between

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[26] John M. Blair, "The Relation Between Size and Efficiency of Business," *Review of Economic Statistics* 24:125-135 (1942).

The author makes the somewhat acid comment:. "What is to be regretted about the T.N.E.C. monograph is not only that it arrives at conclusions different from these indicated by the facts but that it may serve to create a quite erroneous impression concerning the quality of the Federal Trade Commission reports in general and of the Temporary Economic Committee Monographs in particular."

[27] "These results and the results of similar studies made by others indicate that medium-sized concerns are most efficient in the American Economy." Carl A. Dauten, *Business Finance* (New York: Prentice-Hall, Inc., 1948) pp. 445-446.

"There is a good deal of evidence that very large concerns are not in fact as efficient as smaller enterprises." S. R. Dennison, "The Problem of Bigness," *The Cambridge Journal,* No. 2, November, 1947.

TABLE 3.—COST OF PRODUCTION[a] PER GROSS TON OF BESSEMER PIG AND BASIC PIG IRON (NORTHERN FURNACES) IN 1910 FOR THE FURNACE PLANTS OF THE U. S. STEEL CORPORATION

Tonnage per plant	Bessemer Pig Iron		Basic Pig Iron	
	Average integration furnace cost	Average cost above material	Average integration furnace cost	Average cost above material
Under 150,000	$10.85	$1.75	$10.66	$1.36
150,000–300,000	10.20	1.32	10.26	1.02
300,000–450,000	9.65	1.05	9.76	.98
Over 450,000	9.56	.97	10.02	.97
Average, all plants	$ 9.71	$1.05	$10.09	$1.02

Source: Report of the Commissioner of Corporations on the Steel Industry, Part III, *Cost of Production* (1913).

[a] Does not include general expense or depreciation, which were assumed to be 50 cents a ton.

NOTE: Similar data are shown for Bessemer billet ingots and basic open-hearth ingots (pp. 426, 434).

the largest and smallest plants illustrated in this table. Therefore the lack of comparability precludes any clear-cut conclusion with respect to the indicated superiority on the part of the big plants.

Differences in costs based on size of company are given for the 1902-1906 period in Table 4, which shows that, inclusive of materials, the larger steel companies had considerably lower costs for pig iron, ingots, and billets. Exclusive of materials, however, the larger companies had higher costs, except for basic pig iron.

During 1918 the Federal Trade Commission collected data on relative costs in the steel industry which have been arranged by size of firm

TABLE 4.—TOTAL COST OF PRODUCTION PER TON FOR SPECIFIED IRON AND STEEL PRODUCTS (EXCLUDING TRANSFER PROFITS[a]), 1902-06 AVERAGE

Product	Including metallic mixture and coke		Excluding metallic mixture and coke	
	Large companies[b]	Small companies[c]	Large companies[b]	Small companies[c]
Bessemer pig iron	$11.93	$14.21	$2.73	$2.66
Basic pig iron	11.65	13.90	2.28	3.11
Bessemer billet ingots	15.26	19.12	2.64	2.45
Large Bessemer billets	17.46	22.76	2.51	1.63
Bessemer and basic pig iron combined	11.88	14.16	2.65	2.74

Source: Report of the Commissioner of Corporations on the Steel Industry, Part III, *Cost of Production* (1913).

[a] Does not exclude transportation profits, which were considerable in amount for the U. S. Steel Corporation.

[b] U. S. Steel Corporation; Jones & Laughlin Steel Co.; Lackawanna Steel Co.; Republic Iron & Steel Co.; Cambria Steel Co.; Pennsylvania Steel Co.; and Colorado Fuel & Iron Co.

[c] La Belle Iron Works; Wisconsin Steel Co.; Inland Steel Co.; Youngstown Sheet & Tube Co.; Pittsburgh Steel Co.; Wheeling Steel & Iron Co.; Doss-Sheffield Steel & Iron Co.; Sherango Furnace Co.; and fourteen smaller companies.

TABLE 5.—COMPARISON OF RELATIVE COSTS PER TON[a] IN 1918 FOR SPECIFIED STEEL PRODUCTS OF COMPANIES, BY INTEGRATION CLASSES

Product	Including cost of metallic mixture				Excluding cost of metallic mixture			
	Class I	Class II	Class III	Class IV	Class I	Class II	Class III	Class IV
Basic pig iron	100	121	...	...	100	180	...	...
Bessemer pig iron	100	116	...	...	100	130	...	...
Open-hearth ingots	100	124	139	...	100	146	171	...
Bessemer ingots	100	126	142	...	100	173	183	...
Large billets	100	141	151	...	100	127	190	...
Sheared plates	100	133	136	134	100	126	141	135
Structural shapes	100	130	127	151	100	125	150	356
Merchant bars	100	145	139	134	100	126	144	162
Tin plate	100	116	120	122	100	113	119	128

Source: Report of the Federal Trade Commission on *Wartime Profits and Costs of the Steel Industry* (Washington: Government Printing Office, February 18, 1925).

[a] Exclusive of depreciation, general, administrative, and selling expenses.

NOTE: Class I — integrated companies using chiefly their own output of iron ore and coke.
Class II — integrated companies beginning operations with the making of pig iron.
Class III — smaller and less integrated companies beginning with the manufacture of steel.
Class IV — smaller and nonintegrated companies beginning with the rolling of steel products.

in terms of integration classes. These data are shown in Table 5 and indicate that the largest and more highly integrated corporations had much lower costs regardless of the inclusion or exclusion of materials.

Cost of Rubber Tires

Table 6, covering prewar natural rubber tires for 1941 and wartime synthetic tires for 1943, shows that the large tire firms had lower manu-

TABLE 6.—MANUFACTURERS' AVERAGE COSTS[a] PER TIRE FOR REPLACEMENT RUBBER TIRES, 1941 AND 1943

(Size 6.00 x 16, 4 ply passenger car tire)

Cost item	Natural rubber, November, 1941		Synthetic rubber, August, 1943	
	Four large manufacturers	Ten smaller manufacturers	Four large manufacturers	Ten smaller manufacturers
Direct material	$3.763	$3.903	$4.048	$4.348
Direct labor	.432	.541	.867	.996
Net waste	.047	.051	.168	.145
Factory overhead	.793	.797	1.629	1.605
Total factory cost	$5.035	$5.292	$6.712	$7.094
Warehouse and shipping expense	.112	.066	.224	.092
Transportation	.319	.150	.395	.265
Adjustments	.098	.094	.231	.260
Selling, general, and administrative expense	1.548	.836	1.587	.938
Total cost	$7.112	$6.438	$9.149	$8.649

Source: Office of Temporary Controls, Office of Price Administration, Economic Data Analysis Branch, OPA Economic Data Series No. 10, *Survey of Rubber Tire and Tube Manufacturers* (1947), p. 5.

[a] Unweighted arithmetic average.

facturing costs, both inclusive of and exclusive of material costs. Distribution costs, however, were much higher for the large firms and this fact made total costs higher for these businesses. From this condition one author has concluded that the large rubber tire firms are less efficient than the 10 smaller ones.[28]

Further analysis is necessary, however, before any such conclusion can be valid. Not only do we have no data concerning the location of the large as compared with the smaller firms, but we also know that the distribution procedures differ. The larger businesses not only distribute over a much larger area but also do much of their selling through their own warehouses and sales outlets. Therefore, such costs are included in the totals. The smaller companies, on the other hand, often sell to dealers on an f.o.b. plant basis. In such cases the costs are not comparable, since many of the selling, warehousing, and transportation costs of the smaller firms are borne by other concerns. Also, if the larger firms see fit to sell in distant markets they will naturally have higher distribution costs than the small firms selling in a local market or distributing through a mail order house or other chain store.

In addition, it may be stated that OPA figures on costs were not considered adequate even by the OPA officials, and the procedure for allowing increases in prices based thereon was changed because of the extreme doubt expressed with respect to the validity of the figures. During wartime, also, there were numerous changes in procedure which upset the ordinary relationships. One of the largest tire companies broke up its production line, which had been the most efficient in the industry, for the production of other goods, and, during the war, its costs for replacement rubber tires were among the higher cost categories.

Cost of Producing Crude Petroleum

If averages covering a wide range of oil fields are used, the cost of producing crude oil appears to be slightly lower for companies below the maximum quantity of production, according to data shown in Table 7, as compared with both larger and smaller companies. The figures do not cover any cost of transportation, nor do they differentiate production carried on in different oil fields.[29] A study of separate oil fields, conducted by the United States Tariff Commission for 1939, 1940, and the first three quarters of 1941, showed that degree of capacity utilized was a very important consideration; the firms with the

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[28] John M. Blair, "Does Large-Scale Enterprise Result in Lower Costs?" *American Economic Review* 38:148-150 (Supplement, May, 1948).

[29] Data furnished in T.N.E.C. Monograph No. 13 show a considerably higher cost for both Standard and non-Standard major oil companies than for medium-sized independents.

TABLE 7.—UNIT COST OF CRUDE PETROLEUM, BY GROUPS OF COMPANIES, ACCORDING TO VOLUME PRODUCED, 1927-1930

(Unweighted averages)

Production Group (barrels per year)	Unit Cost[a]
10,000,000 or more	$1.03
7,500,000–10,000,000	1.13
5,000,000–7,500,000	1.02
2,500,000–5,000,000	99
1,000,000–2,500,000	1.02
900,000–1,000,000	1.04[b]
800,000–900,000	1.19
700,000–800,000	1.35
600,000–700,000	1 12
500,000–600,000	1.29
400,000–500,000	1.20
300,000–400,000	1.11
200,000–300,000	1 45
100,000–200,000	1.49
50,000–100,000	1.53
25,000–50,000	1.74
Less than 25,000	2.23

Source: United States Tariff Commission, Report No. 30, Second Series (1932), p. 175.
[a] Net cost, including interest on investment.
[b] Three-year average.

largest production had the lowest cost only in the Long Beach field and for 1941.[30]

Cost of Bread

Most studies on the cost of bread, like that in Table 8, indicate that costs are lowest for some size group other than the largest. The

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[30] United States Tariff Commission, for the Office of Price Administration, *Report on the Cost of Producing Crude Petroleum* (Washington, 1942), pp. 19-20.

TABLE 8.—COST PER POUND OF BREAD FOR PLANTS OF WHOLESALE AND COMBINED WHOLESALE AND HOUSE-TO-HOUSE COMPANIES, 1922-25

Based on arithmetic progression			Based on geometric progression		
Production per plant, pounds per year	Cost in cents		Production per plant, pounds per year	Cost in cents	
	Total	Excluding ingredients		Total	Excluding ingredients
Less than 5,000,000	7.16	3.90	Less than 1,687,500	7.70	4.29
5,000,000–10,000,000	6.96	3.76	1,687,500–2,531,250	7.44	4.13
10,000,000–15,000,000	6.62	3.49	2,531,250–3,796,875	7.28	3.97
15,000,000–20,000,000	6.38	3 27	3,796,875–5,695,312	6.91	3.71
20,000,000–25,000,000	6.68	3.46	5,695,312–8,542,968	6.95	3.73
25,000,000–30,000,000	6.46	3.20	8,542,968–12,814,452	6.78	3.63
30,000,000–35,000,000	6.31	3.15	12,814,452–19,221,678	6.46	3.35
More than 35,000,000	6.85	3.54	19,221,678–28,832,517	6.59	3.35
			28,832,517–43,248,775	6 53	3.31
Average	6.69	3.50	Average	6.69	3.50

Source: Federal Trade Commission, *Competition and Profits in Bread and Flour*, Senate Document No. 98, 70th Congress, 1st Session (1928), pp. 295, 297.

TABLE 9.—UNIT COSTS FOR FIVE GROUPS OF WHOLESALE BREAD BAKERIES, MARCH AND SEPTEMBER, 1945

Company Group	Unit Costs (cents per pound)				
	Total	Materials	Labor	Selling and delivery	General and administrative
March, 1945:					
Big Four	7.55	3.66	1.83	1.83	0.23
10 medium-large	7.39	3.87	1.50	1.63	0.39
Medium-sized	7.56	3.87	1.56	1.67	0.49
Small	7.88	3.92	1.64	1.67	0.65
Smallest	9.34	4.62	2.11	1.83	0.78
September, 1945:					
Big Four	7.58	3.81	1.80	1.76	0.21
10 medium-large	7.41	3.91	1.55	1.61	0.34
Medium-sized	7.60	3.89	1.59	1.66	0.46
Small	7.78	3.93	1.64	1.63	0.58
Smallest	9.12	4.59	2.02	1.74	0.77

Source: John M. Blair, "Does Large-Scale Enterprise Result in Lower Costs?" *American Economic Review* 38: 147 (Supplement May, 1948).

manner in which the figures are set up seems to be significant, however, as is evident from the results shown when the table is based on geometric progression rather than simple arithmetic progression.

Similarly, the unadjusted cost of producing flour is not the lowest for the largest companies, whose production is spread over several geographic areas. No data are available to show comparative costs within each area.

A recent study, as shown in Table 9, indicates the higher comparative wartime costs of the Big Four for labor, selling, and delivery expenses as compared with smaller firms. These more than offset their lower material costs and general and administrative expenses.

Cost of Milk Distribution

A reworking of the original figures used by the Federal Trade Commission on the cost of milk distribution in West Virginia for 22 dealers in 1933 indicates, as shown in Table 10, that costs of distribution were lowest for the largest firms and, exclusive of milk costs, were approximately the same for the two largest classifications. Butter costs, on the other hand, were lowest for centralizers producing from 1,000,000 to 5,000,000 pounds in 1918 and second largest for the biggest companies producing in excess of 20,000,000 pounds each. The difference in costs between the two groups was negligible, however, being less than one-half cent a pound, or approximately one percent.[31]

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[31] T.N.E.C. Monograph No. 13, p. 58.

TABLE 10.—COSTS OF MILK DISTRIBUTION FOR SELECTED WEST VIRGINIA PLANTS, 1933

Number of plants	Pounds of milk purchased per plant	Cost per 100 pounds of milk purchased	
		Distribution	Total
4	More than 3,000,000	$2.04	$3.61
3	2,000,000–3,000,000	2.03	3.84
7	1,000,000–2,000,000	2.16	3.85
8	Less than 1,000,000	2.19	3.89
Average, 22 plants	1,663,034	$2.05	$3.69

Source: R. O. Stelzer and L. M. Thurston, *Milk Distribution Costs in West Virginia*, Bulletin 266, Agricultural Experiment Station, College of Agriculture, West Virginia University (1935), p. 12.

Miscellaneous Cost Studies

Analysis of the cost of producing cement, by size of plant, for 126 plants indicated that the large plants had a substantially lower cost than the small ones, the second largest plant sizes with annual production of between 1,500,000 and 2,224,000 barrels showing a cost three eighths of a cent per barrel lower than that recorded for the plants above that size.[32]

In the production of beet sugar the cost of production per pound was found to be lowest in the largest plants.[33]

On the other hand, unit production costs for 1941-42 in both the mixed and bulk superphosphate fertilizer industries were lowest for companies smaller than the maximum size.[34]

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[32] John M. Blair, "The Relation Between Size and Efficiency of Business," *loc. cit.*, p. 129. Original data were derived from the files of the U. S. Tariff Commission.

[33] *Ibid.*, p. 131. Original data from Tariff Commission.

[34] John M. Blair, "Does Large-Scale Enterprise Result in Lower Costs?" *loc. cit.*

IV. ANALYSIS OF EARLIER STUDIES ON PROFITABILITY

Measurement of Profitability

The term "rate of profit" or "profitability" has been used in different ways, and various methods have been employed as measuring sticks. We are not concerned here with the theoretical question of the economic nature of profit, whether it is a reward for efficiency, a return for the use of capital, or a combination of payments. Profit is a residue remaining after substracting costs and expenses from gross sales and income.

Several methods of measuring profitability have been utilized, depending in part on the purpose behind the measurement. Business interests have sometimes compared dollar profits with total wages or total taxes in an attempt to show that such profits were nominal. Profits per article or per pound have been set forth in an attempt to show how small they were on a unit basis. Of somewhat greater validity is the comparison of profits in relation to sales. This assumes, however, a comparable rate of capital turnover which does not ordinarily exist. General Motors, for example, has lower accounting costs than the Chrysler Corporation, and ordinarily enjoys a rate of profit on sales which is approximately twice that of Chrysler, but the latter has obtained about the same rate of return on net worth. During the war, the renegotiation agencies emphasized rate of return on sales to the extent that competitors with different degrees of integration and rates of capital turnover received vastly different returns on capital investment.[35]

If the ideal were possible, profitability would be measured both in relation to the rate of return on total assets (after removal of certain intangibles), that is, on total capital, and on equity capital. In practice, however, only the return on the latter has been analyzed in studies on relative profitability; and *Statistics of Income* does not provide a separation of interest payments for manufacturing corporations. Therefore, the measure of profitability used in this analysis will be the before- and/or after-tax rate of return on net worth, including preferred stock, in spite of the inconsistency resulting from the different proportions of capital furnished by the stockholders in corporations of different size. It is also recognized that the measurement of net worth as shown by the records of many corporations leaves much to be desired in terms of accurate measurement.[36]

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[35] In connection with the profits made by the meat packers during the First World War, the Federal Trade Commission made the following pertinent comment:

"If a profit of only a cent or two per pound results in an excessively high return on the beef or pork investment, profits on beef or pork are unreasonably large, and no amount of sophistry should be allowed to obscure this fundamental fact. The same reasoning holds true in the rate of profit per dollar of sales, such a return in the rapidly turning business like beef must necessarily appear small. But if it is the equivalent of an excessively high rate on the beef investment, no defense of profits on this ground can be allowed. The rate on investment must always be the deciding factor when the question of reasonableness is under consideration." Report of the Federal Trade Commission, *Meat Packing Industry*, Part V, "Profits of the Packers" (Washington: Government Printing Office, 1920), p. 78.

In the study of efficiency it was noted that many extraneous causal factors other than size entered into differences in cost. Since profits are a residue they are affected by a still larger number of influences. It is therefore impossible in the analysis of profitability to determine clearly in what cases size may be the sole or even the determining factor in differential profit rates. This is another reason why profitability is an especially poor measure of efficiency. In presenting data in relation to size, the author realizes that these extraneous features have not been eliminated, and he does not suggest that size has been the sole cause of a comparatively good or bad rate of return.[37]

Profits Before and After Consolidation

The first attempt to analyze profitability in relation to size was undertaken by Professor Dewing, in an effort to measure the degree of success or failure of a group of combinations formed at the turn of the century. His study was limited in scope to certain types of mergers, since it included only thirty-five companies, incorporated in or about 1900, all of which represented combinations of not less than "five separate, independent and competing plants." It therefore included only horizontal combinations of hitherto competing firms and

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[36] It does not seem necessary, however, to agree with the writer who expressed doubt concerning the whole procedure of measuring return on net worth since, according to his views, the records of corporations are adjusted to show a profit rate which is considered reasonable. He states: "A book net worth figure is, by and large, what a corporation (or rather the particular individual or group of individuals controlling policy in this regard) finds it necessary, convenient, or desirable to have as a net worth figure. While small deviations from this desirable figure may be tolerated, large ones usually are not." T.N.E.C. Monograph No. 12, *Profits, Productive Activities and New Investment*, p. 17.

[37] The Chairman of the Federal Trade Commission, when analyzing the wartime profits of steel companies, stated: "Capable management, or good fortune, in investment and operation, were apparently the major factors in determining the rate of profit, and they, rather than mere size, were the characteristic elements of business success." *Wartime Profits and Costs of the Steel Industry*, p. xiv.

"eliminated from consideration large businesses arising from internal growth, with now and then a sporadic addition from the outside, and those businesses arising from the union of only two or three relatively large units."[38]

Professor Dewing assumed that, to be considered successful, an industrial combination should yield a larger net profit than the sum of the net profits of the component elements that entered into that combination; that it should yield a net profit at least equal to the expectation of the promoters; and that the net earnings should increase greatly over those of the first year.

The promoters of these mergers had expected earnings to increase by an average of 50 percent after consolidation, whereas in fact they declined 18 percent the first year. Although average profits for the first ten years after consolidation were higher than for the first year, they were less than the sum of dollar earnings before consolidation, even without considering the capital additions during the period. Earnings ten years after consolidation were less than those for the first year following the process; this decrease applied to 22 out of the 35 consolidations.

Although Professor Dewing's study has been quoted frequently, and his evidence is generally accepted as rather conclusive, further analysis and a different interpretation are possible. Profits in business tend to fluctuate widely from year to year, but the data on prior earnings utilized in his study were based on only the one year prior to consolidation for 26 of the 35 consolidations. Some question may be raised also concerning the validity of the figures since, according to the author's own statement, "Owing to the meager data ordinarily furnished by the different corporations, especially those obviously unsuccessful, results were obtainable only by using a large amount of guessing. The statements of previous earnings were, almost invariably, taken from the published reports of accountants, chosen in the majority of cases by the bankers who underwrote the original security issues at the time of promotion.[39]

Analysis of the circumstances surrounding the establishment of the United States Steel Corporation in 1901, to use but one example, will cast doubt on the assertion that it was not a successful consolidation, even though it did not immediately fulfill the three requirements of success laid down by Professor Dewing: namely, that profits should be greater after combination than before, that they should equal the expectations of promoters, and that they should increase after the first year. Earnings of the companies entering into the U. S. Steel Corporation were $108 million for the year preceding consolidation,[40] but the promoters anticipated future earnings from the combination to equal only $100 million. Earnings for the first year of U. S. Steel (adjusted to a twelve-month basis from statements for nine months) were shown by Dewing to total $98½ million and were $107.8 million for the tenth year, although the average for the ten years was only $92.9 million. The Commissioner of Corporations reported, however, that according to the company's own annual reports net earnings actually averaged $100 million a year for the first ten years.[41]

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[38] Arthur Stone Dewing, "A Statistical Test of the Success of Consolidations," *Quarterly Journal of Economics* 36:86, 87 (November, 1921).

[39] *Ibid.*, p. 88.

After various adjustments by the Bureau of Corporations, the earnings of the corporation averaged $110,000,000 before deduction of bond and other interest. Based upon these calculations, the return on tangible net worth averaged 12 percent a year for the period. This average would have been even higher had it not been for adverse business conditions which resulted in very low earnings for the three years 1903, 1904, and 1908.

When consideration is given to the uncertainty existing in the steel industry during 1900, uncertainty caused principally by the threat of new competition from Carnegie and the excessive capitalization arising from recent mergers, it might seem that the realization of profits equal to the expectations of the promoters would prove the success of the venture. Promoters generally have not been noted for conservatism in their estimates of future profits.

A further point is significant. The period just prior to the establishment of the U. S. Steel Corporation was one of unusually great prosperity in the steel industry. The profits of the Carnegie Steel Company, for instance, increased from $6,000,000 in 1896 to $21,000,000 in 1899, and almost doubled that figure to $40,000,000 in 1900.[42] These figures seem to be conservative estimates, since a certain indefinite amount of reinvested profits was deducted before the calculation of earnings. Although other steel companies did not show such a phenomenal rise as did Carnegie, it is rather obvious that the profits for 1900 represented in no sense an average suitable for comparative use to measure the success of the consolidation but were the result of a sudden condition of exceptional prosperity in the industry. Before the combination was formed the evidence was clear that the industry would need to adjust itself to smaller profits; this fact was reflected in the estimates of the promoters as to the future profits of the consolidation.

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[40] Horace L. Wilgus, *A Study of the United States Steel Corporation* (Chicago: Callaghan & Company, 1901), p. 110.

[41] *Report of the Commissioner of Corporations on the Steel Industry,* Part 1 (Washington: Government Printing Office, 1911), p. 53. The data show that the U. S. Steel Corporation earned $980,000,000 for nine years and nine months. Increasing 1901 to a full year on a prorata profit basis results in an estimated profit of slightly over $1,000,000,000 for ten years.

[42] *Ibid.,* p. 160.

Furthermore, all the mergers studied were horizontal in character and therefore included otherwise competing firms which were reaching the close of a rapidly expanding period. Increased competition, with falling prices and profits, was expected; and the combinations were saddled with a tremendous excessive capacity which could scarcely be completely utilized, especially under noncompetitive conditions. A major result of the combinations may have been to stave off a period of severe price cutting and low profits.

Such extensive reference to the study by Professor Dewing is warranted solely because it has been quoted, in textbooks and elsewhere,[43] as important and somewhat conclusive evidence on the unprofitability of combinations. On the other hand, two similar, but less publicized, investigations have reached the opposite conclusion.[44]

Professor Edward Sherwood Mead studied the condition of the combinations analyzed by Professor Dewing for the period 1924-1931.[45] All were active at the end of the period, although three of them had been taken over by other firms and six more had gone through reorganization, with two of the six proving successful thereafter. Fourteen had shown outstanding success, whereas eleven of the solvent businesses had not fulfilled the hopes of their promoters. In most of these eleven instances the cause of their mediocre showing was to be found in neither their organization nor their size but rather in external conditions beyond the control of the management. Only five of the thirty-five corporations had a deficit in surplus as of December 31, 1931.

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[43] John M. Blair, "Does Large-Scale Enterprise Result in Lower Costs?" *loc. cit.*

[44] *Mergers in Industry* (New York: National Industrial Conference Board, Inc., 1929). Unfortunately, there is disagreement as to whether the figures and the conclusions in this investigation are compatible.

Adolf A. Berle, Jr., and Gardiner C. Means, in their well-known work on the concentration of large-scale business, appear to conclude that the greater profitableness of the bigger firms is a factor in their rapid rate of growth. They state: "It is quite conceivable that an important part of the increase is explained by the greater profitableness of large corporations; but the fact that the change coincides roughly with the change shown for corporate wealth tends to strengthen the conclusion that the large corporations have increased greatly both their proportion of the wealth and their proportion of the income of all corporations." *The Modern Corporation and Private Property* (New York: The Macmillan Company, 1932).

[45] *Corporation Finance* (New York: D. Appleton-Century Company, Inc., 1933), pp. 474-480.

Considering the ordinary business mortality rate, Mead concluded that the combinations had not proved to be less economic in character than business generally. In fact, their record appeared to be far better than average, especially considering the fact that many of them were established with little thought for economy but were founded to obtain a monopoly which in many instances did not materialize. To quote Professor Mead; "Let it be repeated that these companies, with few exceptions, started as potential monopolies. Their capitalization was based upon the anticipated profits of market control. The hopes of monopoly were not realized, and these far-flung consolidations have been forced to rely upon the economies of centralized management, and the advantages of big business. It is indeed remarkable, and a striking refutation of their critics, that they have won such a large measure of success."[46]

In another study, Professor Shaw Livermore attempted to correct the general impression that the movement of 1900 had turned out badly from the point of view of profits realized.[47] Instead of studying only a limited group of corporations, as did Professor Dewing, he concluded that all significant mergers for the period should be considered. Two lists were compiled; the first comprised those mergers which subsequently gained a dominant place in their industries, and the second group consisted of the mergers which did not obtain a controlling influence. In the primary list of the most important mergers, totaling 159 companies, 48.7 percent were successful in maintaining a stable level of satisfactory earnings and 10.9 percent were marginal. Almost the same percentage proved successful in the group of 172 less significant mergers.[48]

The successful mergers had an earnings experience which compared favorably with that of the group of corporations studied by Professor Ralph C. Epstein,[49] which in turn had shown results superior to the average for all corporations. Professor Livermore did not agree that the record warrants the usual conclusion that the early merger movement was a failure but rather considered it to have been surprisingly successful. He stated that:

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[46] *Ibid.*, p. 478.

[47] "The Success of Industrial Mergers," *Quarterly Journal of Economics* 50:68-96 (November, 1935).

[48] Because of the fact that this second group of mergers, which developed little if any monopoly control, had the same degree of success as the first group, it was concluded that monopoly had little influence in the success of the merger movement. The exercise of unusual business ability was credited with the success of the mergers.

[49] *Industrial Profits in the United States* (New York: National Bureau of Economic Research, Inc., 1934).

> A statistical examination of these 1888-1905 consolidations reveals that one-half of the consolidations which truly deserve that title have not only maintained a continuous existence but have been "successes" during the succeeding quarter century, measured by a reasonable standard. Secondly, the actual rate of earnings of those which can be called successful compared favorably with the demonstrated rate of all successful industrial companies in the post-war period. This record becomes more impressive in the light of our knowledge of the high mortality prevailing among corporate enterprises generally.[50]

Early Studies on Profitability

The earliest inclusive data which have been prepared on the profitability of corporations of different size were published by the United States Treasury Department.[51] The statements were compiled from materials furnished by each corporation with net income for the calendar 1919 to support its claims for exemption from the war profits and excess profits taxes for that year. These figures, shown in Table 11, indicate that the average return on invested capital for income corpo-

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[50] *Loc. cit*, p. 69. No comparison was made by either Mead or Livermore between the percentage of failures found in these mergers and that for corporations of a comparable size. Statistics of failures for all corporations have little significance here because of the predominance of failures in very small business.

[51] *Statistics of Income*, 1919 (Washington, 1922).

TABLE 11.—PERCENTAGE RATES OF RETURN ON INVESTED CAPITAL FOR CORPORATIONS REPORTING NET INCOME, BY AMOUNT OF CAPITAL INVESTED, 1919

Invested Capital Class (thousands of dollars)	Number of corporations[a]	Percentage return on invested capital	
		Before taxes	After taxes
Less than 25	79,114	24.8	21.9
25–50	35,402	20.8	17.8
50–100	28,295	17.3	13.5
100–250	25,076	17.3	13.0
250–500	10,520	18.3	13.4
500–1,000	6,147	18.0	13.1
1,000–5,000	5,909	16.9	12.4
5,000–10,000	785	15.0	11.1
10,000–50,000	660	12.6	9.8
50,000–100,000	75	9.8	8.1
100,000 and over	54	9.6	7.9
All sizes	192,037	14.1	10.8

Source: Bureau of Internal Revenue, *Statistics of Income, 1919*, pp. 14-15.

[a] Of the 320,198 corporations reporting, 110,564 showed no income and 17,597 of the income corporations did not clearly indicate their invested capital.

rations was 14.1 percent, with a range from 24.8 percent for those with less than $25,000 of invested capital to 9.6 percent for businesses having $100,000,000 or more of invested capital.[52] Between these two extremes of size the rate of profit declined gradually, except for the fact that the variation up or down after taxes stayed within about a one-percent range for corporations with invested capital between $50,000 and $5,000,000.

This decline in the rate of profit received by wholly or predominantly profitable corporations, as the size of company investment increases, has been noted in other studies and is shown in *Statistics of Income* for 1931 and subsequent years.

The Federal Trade Commission analyzed profits during the first World War in the meat-packing and steel industries. It found that the medium-sized independent packers were the most profitable, and that even the largest of the independents made a higher return on net duction the smallest firms, those with less than $300,000 of investment, worth for 1918 than did the Big Five in the industry.[53] In steel pro- were the most prosperous in three of the four years ending with 1918, but those with investment between $300,000 and $3,000,000 had the largest average rate of return for the four years.[54] Medium-sized corporations also made the best showing in the bread and flour industries.[55]

H. B. Summers conducted a rather extensive survey covering 1,130 Canadian and American corporations listed in Moody's and Poor's Manuals.[56] In those fields in which industry was concentrated in a few units the coverage was rather complete. In others, however, the companies were chosen somewhat at random, apparently on the basis of the data available for the period 1910 to 1929 inclusive. This meant that the firms analyzed were the better-known ones and those exhibiting much more than average economic stability. The breakdown for industrial groups, shown in Table 12, indicates that the smaller firms, with less than $2,000,000 of investment, were considerably more profitable than those with over $100,000,000, but that the corporations in between these extremes did not clearly show any such decrease in earnings as size increased, except in chemicals and textiles. In this entire study the representation of small firms was rather meager; this, com-

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[52] The percentage of net income to net worth was the highest (383.75%) for the 741 corporations with invested capital of less than $500.

[53] "Profits of the Packers," *loc. cit.*

[54] *Wartime Profits and Costs of the Steel Industry.*

[55] Federal Trade Commission, *Competition and Profits in Bread and Flour,* Senate Document No. 98, 70th Congress, 1st Session, 1928.

[56] "A Comparison of the Rates of Earning of Large-Scale and Small-Scale Industries," *Quarterly Journal of Economics* 46:465-479 (May, 1932).

TABLE 12.—AVERAGE PERCENTAGE RATES OF EARNINGS ON INVESTMENT FOR 1,120 CORPORATIONS, 1910-1929

Investment Class (thousands of dollars)	All companies	Automobiles	Chemicals	Foodstuffs	Hardware	Iron-Steel	Machinery	Petroleum	Textiles	Miscellaneous
Less than 2,000	11.6	18.5	24.5	9.8	11.2	11.2	8.0	18.7	7.8	12.3
2,000–5,000	9.2	13.6	20.4	9.2	11.0	8.0	6.5	10.6	8.0	8.9
5,000–10,000	9.3	17.4	11.8	9.1	8.7	7.8	9.4	11.5	8.4	8.9
10,000–25,000	8.8	14.5	10.7	8.3	8.8	7.8	7.5	10.3	7.6	9.1
25,000–50,000	9.4	14.1	8.0	10.7	19.8	7.1	6.7	11.3	6.8	8.1
50,000–100,000	9.8	9.8	7.2	8.0	12.7	8.9	7.4	10.9	4.9	9.3
100,000 or more	9.5	17.9	17.3	7.6	12.7	7.1	9.3	11.7	1.0	9.3

Source: H. B. Summers, "A Comparison of the Rates of Earning of Large-Scale and Small-Scale Industries," *Quarterly Journal of Economics* 46: 465-479 (May, 1932).

bined with the fact that the study included some unprofitable corporations and some unprofitable years, undoubtedly explains the lesser degree of variation between the largest and smallest businesses as compared with that shown by the data prepared from income tax returns for 1919 by the Bureau of Internal Revenue.

Like numerous other investigators, Mr. Summers linked efficiency to evidences of profitability, and stated:

> It is reasonable to suppose that those who have undertaken the formation of these great industrial enterprises have acted in the belief that larger units of industry are productive of lower production costs and higher rates of profit. Information is not available as to actual production costs of any considerable number of companies; so rates of earnings have been taken as affording at least a fair index of comparative production costs, and the only index available for any large number of concerns.[57]

A special type of study, although very limited in scope, was prepared by Professor Epstein in 1931. It covered the sixteen principal corporations in the automobile industry for the period from 1919 through 1927.[58] In the latter year these companies owned 99 percent of the capital invested in the industry and produced 95 percent of the passenger cars.

The study related three sets of data: (1) size of firm and rate of earnings; (2) size of firm and stability of earnings; and (3) rate of earnings and stability of earnings.

According to the investigation the two largest companies earned at only about the median rate. "In nearly all years, the firm enjoying the

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[57] *Ibid*, pp. 465, 468-469.

[58] "Profits and Size of Firm in the Automobile Industry, 1919-1927," *American Economic Review* 21:636-647 (December, 1931) The sixteen companies included in this study were: Auburn, Chrysler, Dodge, Ford, Franklin, General Motors, Hudson, Hupp, Jordan, Nash, Packard, Peerless, Pierce-Arrow, Reo, Studebaker, and Willys-Overland.

TABLE 13.—RELATIONSHIP BY RANK AMONG SIZE, RATE OF EARNINGS, AND STABILITY OF EARNINGS FOR SIXTEEN AUTOMOBILE COMPANIES, 1919-1927

Size	Rate of earnings	Stability of earnings
1	5	9
2	8	10
3	9	1
4	4	5
5	16	16
6	10	8
7	3	6
8	1	2
9	2	7
10	6	3
11	15	13
12	7	4
13	12	12
14	14	15
15	11	11
16	13	14

Source: Ralph C. Epstein, "Profits and Size of Firm in the Automobile Industry, 1919-1927," *American Economic Review* 21: 641, 644 (December, 1931).

NOTE: The coefficients of rank correlation were as follows: (1) Size of capital and rate of earnings +.38; (2) size of capital and stability of earnings +.36; (3) rate of earnings and stability of earnings +.76.

highest return of all is one which, in point of invested capital, stands at or fairly near the median size."[59] For the whole period the three largest firms ranked fifth, eighth, and ninth, respectively, in return on capital investment,[60] while the companies with the highest rates of profit were eighth, ninth, and seventh, respectively, in size. Nor did the earnings of the larger corporations fluctuate less widely than those of the smaller ones. A fair degree of correlation was evidenced, however, between a high rate of earnings and stability of earnings, as noted in Table 13, which shows the relationships found in the three sets of data.

Professor Epstein attributed a considerable proportion of this advantage possessed by the medium-sized firm to the differentiation in products found in the automobile industry. "In a situation where each producer possesses, in a sense, a monopoly of his particular article, the ordinarily accepted advantages of size (enlarged buying power, lower factory overhead costs per unit of product) do not count so much as commonly assumed. At least they are not decisive. And where the capacity for innovation in product, instead of merely an ability to standardize the details of plant and organization, is present as a requisite for industrial success, perhaps no high correlation between size and earning power ever exists."[61]

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[59] *Ibid.*, p. 639.

[60] Capital investment consisted of bonded debt plus net worth, less certain intangibles such as goodwill, patents, trademarks, etc.

[61] *Op. cit.*, pp. 645, 646-647. The author rather tentatively connects profitability with efficiency in stating: ". . . . in a competitive system which relies on

TABLE 14.—EARNINGS RATES OF 2,046 MANUFACTURING CORPORATIONS, BY CAPITAL CLASSES, 1924 AND 1928

Size of Capital (thousands of dollars)	1924		1928	
	Number of corporations	Percentage of earnings to total capital	Number of corporations	Percentage of profit to total capital
Less than 500	230	20.3	187	20.2
500–999	461	17.7	376	13.4
1,000–2,499	596	15.4	607	13.6
2,500–4,999	310	12.9	351	14.0
5,000–24,999	315	9.5	376	9.7
25,000–49,999	68	12.6	67	11.8
50,000 and over	66	8.1	82	9.8
All sizes	2,046	9.5	2,046	10.4

Source: Ralph C. Epstein, *Industrial Profits in the United States* (New York: National Bureau of Economic Research, Inc., 1934).

A much more complete analysis of profitableness in relation to size was included in Professor Epstein's study on industrial profits.[62] A summarization of the results of this analysis is given in Table 14. This shows that, based on 2,046 manufacturing corporations for 1924 and 1928, those corporations with invested capital of less than $500,000 had the highest rate of profit; thus he reached the same general conclusion as did Summers with respect to the inverse relationship between size and profitability. When the corporations were separated into the three industrial categories, foods, chemicals, and metals, each of these divisions showed the same characteristic decline in profit rate with an increase in size.[63]

A similar study was made by Professor William A. Paton, who compiled data from a sample of 714 small and medium-sized corporations for the three years 1927 to 1929 inclusive.[64]

Although no very large corporations were included in the investigation, the average net assets were $2,244,000 as compared with an average of $643,000 for all U. S. corporations. As indicated in Table 15, the corporations with assets totaling less than $200,000 had the highest

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profit-making as a motive for the economic conduct of industrial operations, if it can be shown that large-scale production is ordinarily no more profitable per unit of investment than small, the presumption is that the development of the larger establishments, upon the grounds of productive efficiency, need not be encouraged. Such a conclusion, however, is not as yet warranted upon the slight basis of the facts concerning one industry, for a nine-year period, as presented in this paper." (p. 647)

[62] *Industrial Profits in the United States.*

[63] *Ibid.*, p. 138.

[64] *Corporate Profits as Shown by Audit Reports* (New York: National Bureau of Economic Research, Inc., 1935).

TABLE 15.—AVERAGE EARNING RATES ON NET BOOK ASSETS FOR 699 CORPORATIONS, BY SIZE GROUPS
(Ratio of three-year aggregates, 1927-1929)

Asset Class (thousands of dollars)	All corporations[a]		Manufacturing corporations		Trading corporations	
	Number of companies	Rate of earnings	Number of companies	Rate of earnings	Number of companies	Rate of earnings
0–200	198	9.40	78	11.34	66	6.37
200–500	140	7.81	53	10.69	61	5.43
500–1,500	160	8.07	85	7.30	44	7.24
1,500–5,000	129	7.58	79	8.27	35	6.51
Above 5,000	72	8.02	46	8.60	16	7.23
All sizes	699	8.32	341	9.20	222	6.30

Source: William A. Paton, *Corporation Profits as Shown by Audit Reports* (New York: National Bureau of Economic Research, Inc., 1935), pp. 3, 73.
[a] Includes companies other than manufacturing and trading.

rate of profit, 9.4 percent. This same relationship held true for manufacturing corporations but not for the trading corporations. "Within the subgroups for each category there were no consistent differences in earnings rates between large and small corporations. In the manufacturing field, smaller companies showed higher rates of return than did larger companies in 16 out of 28 subgroups. In the trading field, the situation was the reverse in 10 out of 15 subgroups."[65]

The highest rates of profit in manufacturing and retail trade in Wisconsin for 1928 were received by the largest corporations, according to a study by the Wisconsin Tax Commission.[66] Corporations with capital investment of between $100,000 and $300,000 were the most profitable among the wholesale establishments for that year. See Table 16 for additional detail.

Prior to the publication of *Statistics of Income* for 1931, data supplied by the United States Treasury Department did not classify corporations by size of assets. They were classified, prior to that year, however, by size of net income. This is not a very satisfactory measure of size, since a large corporation may have a small income or a small deficit. A small corporation, on the other hand, is not likely to have a large income but may have a sizable deficit. After mentioning these

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[65] *Ibid.*, p. 5. Earnings of the very small companies, those with assets of less than $50,000, did not exhibit a good record.

[66] Wisconsin Tax Commission, Bulletin No. 45 (Madison, Wisconsin, April, 1931). Similar data for 1930, which show the same relationship between large and small business on a different level of income or loss, can be found in the Commission's Bulletin No. 48, December, 1931.

TABLE 16.—BOOK INVESTMENT AND 1928 TAXABLE INCOME OR LOSS OF CORPORATIONS, BY SIZE OF INVESTMENT

Investment Class (thousands of dollars)	All corporations		Corporations with taxable income		Corporations with a loss	
	Number of companies	Percent of income to investments	Number of companies	Percent of income to investments	Number of companies	Percent of loss to investments
			A. Manufacturing			
0–50	1,933	2.77	1,179	16.34	754	21.63
50–100	517	3.63	361	12.32	156	17.01
100–300	582	6.42	433	13.66	149	13.80
300–500	148	6.38	112	12.06	36	12.08
500–1,000	134	6.17	106	11.62	28	14.79
1,000–5,000	114	8.89	93	11.94	21	6.72
5,000 and over	12	18.94	11	20.62	1	18.75
All sizes	3,440	9.39	2,295	14.34	1,145	12.89
			B. Retail Trade			
0–50	1,769	3.10	1,143	12.00	626	17.26
50–100	374	4.16	292	8.50	82	10.68
100–300	207	6.94	174	9.67	33	7.90
300–500	25	8.15	24	8.56	1	3.18
500–1,000	15	8.39	12	11.04	3	3.14
1,000 and over	10	10.38	10	10.38	.	
All sizes	2,400	6.36	1,655	10.12	745	12.28
			C. Wholesale Trade			
0–50	388	2.57	245	13.26	143	19.62
50–100	107	4.50	81	10.03	26	11.47
100–300	134	16.09	108	21.29	26	8.20
300–500	13	6.21	13	6.21		
500–1,000	17	5.90	15	8.76	2	19.06
1,000 and over	8	5.23	7	5.92	1	4.70
All sizes	667	8.21	469	11.62	198	12.06

Source: Wisconsin Tax Commission, Bulletin No. 45, April, 1931, pp. 3-4.

reservations, Professor William L. Crum classified corporations on the basis of net income size for 1926.[67] The data showed that the ratio of net income to assets increased rapidly up to an income of $100,000. "From there on, increases in the amount of net income are in general not accompanied by further increases in the earnings ratio. . . . This relation between the earnings ratio and the amount of net income clearly suggests that the smaller companies have on the whole a lower rate of return on their total assets."[68] See Table 17 for details on manufacturing corporations.

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[67] *Corporate Earning Power* (Stanford University, California: Stanford University Press, 1929), pp. 145-153.

[68] *Ibid.*, pp. 148-149.

TABLE 17.—PERCENTAGE RATIOS OF NET INCOME TO ESTIMATED TOTAL ASSETS, FOR MANUFACTURING CORPORATIONS, BY INDUSTRY GROUPS AND AMOUNT OF NET INCOME, 1926

Net Income Class (thousands of dollars)	All groups	Chemicals	Food products	Leather	Lumber	Metals	Paper	Printing	Rubber	Stone, etc.	Textiles
0-5	2.06	1.85	1.72	2.11	1.57	2.12	1.86	3.33	2.28	2.57	2.03
5-10	3.98	3.70	3.64	4.26	3.21	4.30	4.01	6.84	4.78	3.71	3.36
10-50	6.17	6.64	5.52	6.62	5.51	6.37	4.81	8.79	2.76	7.27	5.66
50-100	7.89	8.54	7.88	9.01	6.31	8.29	5.63	11.35	7.36	6.85	7.37
100-250	9.29	8.20	9.45	9.42	8.29	9.81	7.59	11.42	7.72	10.28	8.39
250-500	9.59	8.01	7.60	8.72	8.16	11.67	9.62	10.17	12.37	9.28	9.57
500-1,000	9.04	9.13	9.77	6.92	7.96	9.34	8.61	9.14	6.00	9.27	8.71
1,000-5,000	8.47	6.64	8.18	....	....	9.44	6.42	17.10	....	13.44	....
Over 5,000	9.21	6.28	10.47	....	....	10.36	10.60	7.81	....	13.28	....

Source: William L. Crum, *Corporate Earning Power* (Stanford University, California: Stanford University Press, 1929), p. 152.

Additional Comment on Early Studies of Profitability

Most of the studies on the relative profitability of corporations of different size, prior to the publication of *Statistics of Income* for 1931, represented samples of more or less limited scope. None of them were suggested as being necessarily characteristic of all corporations, but conclusions were drawn as though they were in fact so characteristic.

Investigations such as that of Dewing were faulty in certain of their details and generalizations, as discussed previously, so that other students were able to reach opposing conclusions with what would appear to be a more reasonable degree of validity. The material published by the Bureau of Internal Revenue for 1919 showed a basic trend for corporations reporting a net income which has been found in more recent analyses. The investigations of Summers, Epstein, and Paton included primarily those businesses which were more significant and more permanent than the average; they therefore showed in aggregate the features of profitable firms, even though some corporations in the studies were suffering current losses. In general result they agreed with the 1919 returns reported to the Bureau of Internal Revenue.

The special survey of the automobile industry, which found the middle-sized firms to be the most profitable, reached the same conclusion as the Federal Trade Commission in its findings on the steel, meat-packing, bread, and flour industries; namely, that the smaller or medium-sized firms are the most profitable. Unfortunately, Epstein's investigation of the automobile industry did not cover the succeeding decade, in which seven of the companies stopped production of passenger cars entirely while three others practically ceased operation, combined, or went through receivership. In addition, it may be stated that the medium-sized firm which stood at the top in the survey had very poor earnings in the succeeding ten years. This amply illustrates the errors in conclusions which may result from analysis for a particular interval of time in a dynamic industry.

The Wisconsin study, on the other hand, showed that large-scale business was more profitable. A closer investigation indicates, however, that the variation could well have been caused by differences in profitability in the various industries operating in the state. These ranged from a low return of 0.62 percent on investment for stone, clay, and glass products to a high of 16.96 percent in metal products. The former had an average investment of $66,000, and the latter an average of $319,000, compared with an average of $199,000 for all manufacturing companies. This would suggest that, in aggregate, the larger corporations of the state may have been more profitable because they operated in industries with higher average profits.

In Professor Crum's analysis, which used size of income as the measure of size of company, the showing of the largest firms was improved by the fact that any of them which did not have very high earnings were included in some other groups, while it is not likely that any of the smaller businesses would be in the higher income categories.

One article summarized the situation very well in stating, "The diversity of results obtained by different analysts makes one suspicious that hidden within the over-all data are cross currents turbulent enough to make generalizations on the basis of over-all data misleading, to say the least."[69]

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[69] Edwin B. George and Robert L. Tebeau, "Profits and Dividends: Big Business vs. Small," *Dun's Review* 48:16 (January, 1940).

V. CURRENT ANALYSIS ON RELATIVE PROFITABILITY

Recent Studies on Profitability

In the recent analyses of profitability in relation to the size of corporations numerous investigators have made extensive use of figures shown in the current volumes of *Statistics of Income*[70] which, since 1931, have included income data classified by asset size.[71] The most extensive studies were conducted by Professor Crum, who was not concerned with profitability in relation to scale of operations or the question of efficiency in relation to size, but rather was interested in the relationship between profit and size from the point of view of the corporate legal and financial entity.[72] On the basis of income tax data for the years 1931 to 1936 inclusive, he found the largest companies to be the most prosperous and reached the general conclusion:

> 'I believe my findings clearly show that, on the average, large enterprise — in all or nearly all broad lines of industry, and in different stages of the economic cycle — is 'more profitable than small enterprise, especially very small enterprise.' I fail to see that this suggests the wisdom of imposing punitive restraints on large industrial enterprise. . . . I gladly grant that the profit showing of smaller enterprise might be more satisfactory if large enterprise were eliminated or restricted, but I find no clear evidence in support of this view.[73]

Unfortunately, the investigations of Professor Crum were not extended by him beyond 1936. As business recovered from the depression, the rate of return on net worth for medium-sized firms exceeded that for the largest corporations, even prior to the war.[74] (A presentation and discussion of data compiled from original income tax return figures published in the volumes of *Statistics of Income* from 1931 to 1946 inclusive will be given in the following section of this chapter.)

During the war period, the Office of Price Administration compiled data which compared sales, profits, and return on net worth for 2,500

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[70] U. S. Treasury Department, Bureau of Internal Revenue, *Statistics of Income* (Washington: Government Printing Office, 1931-1946).

[71] For a discussion of problems involved in the utilization of such data for comparative purposes, see Ralph C. Epstein, *Industrial Profits in the United States* (New York: National Bureau of Economic Research, Inc., 1934). Preliminary Note by Wesley C. Mitchell.

[72] *Corporate Size and Earning Power* (Cambridge: Harvard University Press, 1939).

[73] *Ibid.*, pp. 7-8.

[74] For a detailed analysis including separate industrial groups for 1939, 1941, and 1942, see Joseph L. McConnell, "Corporate Earnings by Size of Firm"; "1942 Corporate Profits by Size of Firm"; *Survey of Current Business,* May, 1945, pp. 6-12; January, 1946, pp. 10-16, 20.

TABLE 18.—RATIOS OF SALES TO NET WORTH; PERCENTAGE RETURNS ON SALES AND NET WORTH (BEFORE TAXES) FOR 2,500 LEADING INDUSTRIAL CORPORATIONS DISTRIBUTED BY 1939 AND 1944 ASSET SIZE

1939 Assets (millions of dollars)	Number of companies	Ratio of sales to net worth		Percentage returns				1944 Assets (millions of dollars)	Number of companies	Ratio of sales to net worth 1944	Percentage returns, 1944	
				Profit on sales		Profit on net worth					Profit on sales	Profit on net worth
		1936-1939	1944	1936-1939	1944	1936-1939	1944					
Less than 1.0	727	2.19	4.24	3.6	9.5	7.9	40.3	Less than 1.0	461	3.35	6.9	23.1
1.0–2.4	531	1.81	3.90	5.5	10.0	9.9	39.0	1.0–2.4	540	2.82	9.7	27.5
2.5–4.9	389	1.58	3.27	6.2	11.0	9.8	36.0	2.5–4.9	395	2.75	10.4	28.6
5.0–9.9	315	1.36	3.24	6.5	10.5	8.9	34.0	5.0–9.9	383	2.56	11.7	29.9
10.0–19.9	227	1.30	2.85	6.9	10.3	8.9	29.4	10.0–19.9	269	2.47	10.8	26.6
20.0–49.9	163	1.27	2.96	7.8	10.3	9.9	30.4	20.0–49.9	238	2.59	11.1	28.8
50.0–99.9	67	1.46	3.17	7.4	9.9	10.7	31.3	50.0–99.9	94	2.81	10.1	28.4
100.0–199.9	44	1.18	2.09	7.8	10.2	9.3	21.3	100.0–199.9	61	2.59	10.8	27.9
200.0–499.9	26	1.23	2.31	8.5	10.4	10.4	24.0	200.0–499.9	42	2.93	9.2	27.1
500.0 or more	11	0.71	1.37	13.8	12.9	9.7	17.7	500.0 or more	17	1.68	12.0	20.2
All sizes	2,500	1.16	2.41	8.4	10.6	9.8	25.6	All sizes	2,500	2.41	10.6	25.6

Source: Office of Temporary Controls, Office of Price Administration, *Profits Growth to Wartime Peak*, War Profits Study No. 16, March, 1947, p. 140.

leading industrial corporations[75] in 1944 with their prewar 1936-1939 average. Table 18 classifies the businesses by both 1939 and 1944 size groups. As the war progressed the number of firms with less than $1,000,000 of assets decreased from 727 to 461. When firms were arranged by 1939 asset size, the ratio of sales to net worth doubled in total, increasing from 1.16 to 2.41, and doubled in most of the size groups, increasing from 2.19 to 4.24 for the smallest firms and from 0.71 to 1.37 for the largest.

For the prewar average, the rate of profit on sales was lowest for the smallest corporations and increased steadily with an increase in the size of firm. During the war, however, the doubling of net worth turnover improved the relative position of the small firms in terms of rate of profit on sales. Aside from the group of corporations with assets of less than $1,000,000, which had smaller profits, the 1936-1939 rate of return on net worth did not seem to vary consistently with the size of corporation. During the war, however, the before-tax rate of return on net worth for these corporations, all of which had a continuous existence for the whole period, varied inversely with size, being 40.3 percent for the smallest firms as compared with 17.7 percent for those corporations with 1939 assets in excess of $500,000,000.

When the 2,500 corporations were reclassified by 1944 size the number of small corporations was reduced and each of the other size groups increased, as some of the corporations in each group were moved up to a higher classification. This had the effect of decreasing the differences in the ratios of sales to net worth in the different size groups, since those companies with a higher turnover were the ones which moved into larger size classifications. The more profitable of the small businesses shifted upward in classification and this decreased the rate of return of the remainder, although the two largest size groups of businesses had a reduced rate of profit on sales with increased numbers. This shift of the more rapidly expanding and profitable businesses into larger size classifications reduced the rate of profit otherwise

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[75] Included were 31 major industries and 90 subgroups; there were 946 corporations in durable goods manufacturing, 1,206 in nondurable goods manufacturing, and 348 nonmanufacturing (service, trade, mining, crude petroleum, and natural gas) corporations. None of the firms had assets of less than $250,000 in either 1939 or 1944, but it was concluded that the "2,500 represent in combination so large a slice of the corporate universe, and are sufficiently well stratified by size, to show clearly the effect of war upon the growth of different-sized concerns and the resultant shifts in their relative importance." Office of Temporary Controls, Office of Price Administration, *Profits Growth to Wartime Peak,* War Profits Study No. 16 (March, 1947), p. 41.

TABLE 19.—EARNINGS AS A PERCENTAGE OF NET WORTH FOR 1,792 MANUFACTURING CONCERNS, 1940, 1944, AND 1945, CLASSIFIED BY SIZE OF ASSETS IN 1941

Asset Class (thousands of dollars)	Durable Goods Industries (769 companies)						Nondurable goods industries (1,023 companies)					
	Before taxes			After taxes			Before taxes			After taxes		
	1940	1944	1945	1940	1944	1945	1940	1944	1945	1940	1944	1945
0–249	15	61	40	12	22	22	11	49	41	10	28	23
250–999	13	52	33	10	16	12	8	31	28	6	12	11
1,000–4,999	18	50	29	12	12	9	11	31	26	8	11	10
5,000–9,999	15	28	18	11	8	8	14	28	23	10	10	9
10,000 and over	18	32	15	12	10	8	12	24	17	9	11	10

Source: Albert R. Koch and Eleanor J. Stockwell, "The Postwar Financial Position of Business," *Federal Reserve Bulletin* 32:1339 (December, 1946).

TABLE 20.—PERCENTAGE RATES OF RETURN ON NET WORTH (AFTER FEDERAL TAXES) FOR MANUFACTURING CORPORATIONS, BY QUARTERS, 1947, 1948, AND 1949

Asset Class (thousands of dollars)	1947				1948				1949			
	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter
0–249	4.1	4.5	4.8	0.9	1.8	3.4	3.8	−0.2	2.1	1.2	2.1	−0.5
250–999	5.1	4.5	4.4	3.0	4.1	4.3	3.5	2.3	2.4	1.7	2.3	1.4
1,000–4,999	5.8	4.9	4.3	3.5	4.1	4.0	3.8	2.9	2.5	2.2	2.3	2.0
5,000–99,999	4.7	4.3	3.9	4.2	4.1	4.1	3.9	4.0	3.0	2.4	2.6	2.8
100,000 and over	3.3	3.1	3.1	3.9	4.3	3.8	4.3	4.5	3.6	3.0	3.4	3.5
All sizes	4.2	3.9	3.7	3.8	4.2	4.0	4.0	3.9	3.2	2.6	3.0	2.9

Source: Federal Trade Commission and Securities and Exchange Commission, *Quarterly Industrial Financial Report Series for all United States Manufacturing Corporations*, 1947 through 1949.

shown for the small businesses in the lower classifications. With the distribution of corporations by 1944 size, those of medium size, i.e., those with assets between five and ten million dollars, had the highest rate of return on net worth.

A type of study similar to the foregoing was published in the *Federal Reserve Bulletin.* It included data on 1,792 manufacturing concerns; the corporations with assets in excess of $10,000,000 were those in Moody's Manuals, while figures for the smaller firms came from Robert Morris Associates. The assets were classified by 1941 size and, as shown in Table 19, the results for 1944 and 1945 were similar to those of the OPA study, except that corporations with over $10 million of assets were lumped together. It is possible that some size classification over $10 million would have shown higher rates of profit than for those with $5 to $10 million of assets.

Beginning with the first quarter 1947, the Federal Trade Commission and the Securities and Exchange Commission began a quarterly report series which includes data on net worth.[76] As shown in Table 20, the manufacturing corporations with assets in excess of $100,000,000 had the lowest rate of return for any size group for the first three quarters of 1947 and then improved very markedly to become and remain the most profitable of any size group.

A more detailed study of the return on net worth for the four largest corporations compared with the medium-sized corporations in each of twenty-five manufacturing industries was published by the Federal Trade Commission in December, 1949.[77] The companies included represented not less, and in many cases much more, than 50 percent of the assets in each of the industries. The combined assets of the 25 industries represented 50 percent of the 1940 total assets of all manufacturing industries. Of the 23 industries for which comparable data are presented, the four largest firms were the most profitable in 13 for 1940 and 1947, and in 17 for 1948. (See Table 21 for details.)

The problem arising in using averages is shown, however, by the fact that the weighted averages of returns on net worth for the whole group show the largest corporations to be the most profitable only in 1940, while the unweighted averages indicate a better result for the

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[76] *Quarterly Financial Report Series for all United States Manufacturing Corporations.*

[77] Report of the Federal Trade Commission, *Rates of Return for 528 Identical Companies in 25 Selected Manufacturing Industries, 1940, 1947, and 1948* (December, 1949).

TABLE 21.—PERCENTAGE RATES OF RETURN (AFTER TAXES) ON STOCKHOLDERS' INVESTMENT FOR 522 IDENTICAL COMPANIES IN 23 SELECTED MANUFACTURING INDUSTRIES, BY SIZE GROUPS, 1940, 1947, AND 1948

Industry	1940		1947		1948	
	4 Largest[a]	Others	4 Largest[a]	Others	4 Largest[a]	Others
A. General Data for 522 Companies						
Total net worth (millions of dollars)	13,334	6,542	17,889	9,761	20,083	11,155
Total net income (millions of dollars)	1,492	505	2,767	1,614	3,542	2,095
Rate of return (weighted average)	11.2	7.7	15.5	16.5	17.6	18.8
Rate of return (unweighted average)	11.3	10.9	15.9	13.8	17.8	12.4
Number of industries in which largest companies had higher rate of return	13		13		17	
B. Percentage Returns for Industrial Groups[b]						
19 Primary smelting and refining, nonferrous metals	11.1	9.2	14.0	14.7	15.1	14.7
34 Blast furnaces, steel works, rolling mills	8.0	8.4	10.0	15.4	12.3	18.4
11 Wool carpets and rugs	9.2	8.0	13.3	19.0	15.9	21.5
5 Linoleum and felt base floor covering	7.6	7.5	15.3	16.1	15.8	15.0
41 Petroleum refining	8.1	5.1	13.0	16.2	16.6	22.4
18 Motor vehicles	18.9	4.1	20.9	11.9	26.9	13.2
40 Motor vehicle equipment	16.0	15.8	20.7	18.4	24.3	18.0
16 Tires and inner tubes	9.1	8.1	15.3	15.5	14.5	10.0
28 Industrial chemicals	16.0	10.0	17.9	15.2	20.5	14.1
7 Rayon	8.3	13.5	18.9	15.5	21.8	15.3
11 Flat glass, glassware (pressed or blown)	14.3	5.4	16.9	9.9	17.0	8.2
104 Paper and allied products	10.4	9.3	21.2	21.1	19.5	17.7
8 Cigarettes	14.4	16.9	12.9	5.8	13.9	11.0
9 Cigars	8.4	10.3	12.0	4.4	9.6	5.4
8 Soap, cleaning and polishing preparations	17.7	16.5	25.5	15.5	22.4	4.8
66 Electrical machinery, equipment and supplies	14.6	13.3	18.7	21.1	19.8	16.3
21 Bread	6.0	12.6	15.5	17.2	20.6	18.5
5 Biscuits and crackers	8.7	6.4	21.1	−16.8	18.7	−40.8
6 Tin cans and other tinware	9.4	9.7	10.4	8.0	11.4	14.9
16 Abrasives, asbestos, and miscellaneous nonmetallic mineral products	13.0	17.3	14.9	19.7	17.0	18.8
19 Dairy products	9.1	10.3	14.4	10.1	14.0	7.8
15 Office and store machines and devices	12.8	13.8	25.4	23.9	24.6	22.6
15 Engines and turbines	10.2	18.6	−2.2	18.9	17.1	17.9

Source: *Report of the Federal Trade Commission on Rates of Return for 528 Identical Companies in 25 Selected Manufacturing Industries, 1940, 1947, and 1948* (Washington, December, 1949).

[a] Only 2 largest companies in linoleum and felt base floor coverings, and 3 largest companies in biscuits and crackers.

[b] Figures at extreme left indicate number of companies in group.

large firms in all three years. The difference in results of the weighted averages is occasioned by the fact that one-half of the total assets for the smaller companies was concentrated in just two industries, the rates of return on which showed a very marked increase for 1947 and 1948 as compared with 1940.

Rates of Return on Net Worth Based on Statistics of Income[78]

1. All Corporations

The profitability of corporations is greatly dependent on the stage of the business cycle and varies widely with changing economic conditions. During the period from 1931 to 1946 inclusive the rate of return before taxes for all corporations reporting size of assets varied from a loss of 2.6 percent on net worth in 1932 to a profit high of 19.1 percent for 1943. On an after-tax basis the variation ranged from a loss of 2.8 percent in 1932 to a maximum profit of 9.9 percent for 1946 (the year following the removal of the excess profits taxes).

As shown in Table 22, even wider variations existed each year in profitability as among corporations of different size. At the depth of the depression the largest corporations were the most profitable, or the least unprofitable. As business conditions improved the smaller businesses recovered at a more rapid rate, so that by 1936 the largest size was no longer the most profitable, but the size between $10 and $50 million had the best results. With the advent of war business still smaller size groups realized the highest rates of return on net worth, while, on an after-tax basis. even the very small corporations made a surprisingly good comparative return.

2. Manufacturing Corporations

Over-all figures for corporations are likely to be confusing since they combine so many diverse elements. For example, the rate of profit for the larger corporations is decreased by the fact that the large financial corporations, and to a lesser extent the larger public utility corporations, ordinarily have a low rate of profit. On the other hand,

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[78] Certain problems are always inherent in the use of income tax data, but are not generally susceptible to adjustment by size of firm. Tax laws change in their definition of income from year to year. Tax returns are audited several years after filing, and sizable readjustments in total income are made for each year. Disallowances of expenses, such as officers' salaries, however, are not segregated by size of firm so that it is impossible to ascertain the group on which these disallowances fall the most heavily, or how heavily. During the war, the recalculation of amortization under Certificates of Necessity involved a considerable reduction in the income originally reported on tax returns for the war years. Renegotiation of war profits also reduced drastically some of the excessive profits of individual companies. The recalculation of base-period earnings under Section 722 of the Internal Revenue Code and the carry-forward and carry-back of losses make the use of the original figures of after-tax income for the war period still more uncertain. Furthermore, some firms rebuilt their plants and machinery during the war and charged the expense to current maintenance. It is indeed impossible to find out the relative impact of all these adjustments either in total or by size of asset grouping.

TABLE 22.—PERCENTAGE RATES OF RETURN ON NET WORTH FOR ALL CORPORATIONS REPORTING SIZE OF ASSETS, 1931-1946

Asset Class (thousands of dollars)	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
A Before Taxes																
0–49	−21.6	−32.8	−20.6	−14.7	−10.9	−6.2	−8.2	−13.1	−8.2	−6.6	3.0	8.6	14.6	16.1	15.6	18.2
50–99	−8.9	−13.8	−5.2	−2.2	−0.5	2.7	1.8	1.0	2.0	2.8	9.9	12.9	15.9	15.9	15.8	22.2
100–249	−6.3	−9.7	−4.0	−0.6	1.5	5.0	3.9	1.1	4.3	6.0	12.2	15.7	18.0	17.3	16.1	23.6
250–499	−4.4	−7.1	−2.6	0.4	2.6	5.8	4.9	2.2	5.2	7.2	14.2	18.3	20.5	19.7	17.2	24.6
500–999	−3.6	−6.1	−1.7	0.8	2.9	6.1	5.3	2.8	5.4	7.3	14.9	19.6	22.1	20.8	18.5	24.4
1,000–4,999	−2.7	−4.6	−1.5	1.5	3.6	6.4	6.0	3.2	6.2	7.9	14.7	20.1	22.6	21.5	18.1	21.7
5,000–9,999	−1.5	−3.8	−1.3	1.7	3.5	6.6	6.0	3.4	6.2	7.6	14.7	19.5	22.8	21.0	16.9	19.1
10,000–49,999	−0.2	−2.4	−0.3	3.0	4.9	6.6	6.9	4.2	6.8	8.0	13.0	20.2	22.0	19.8	15.8	15.6
50,000–99,999	2.4	0.5	1.1	3.1	4.7	6.8	6.2	4.0	5.8	8.0	12.8	17.7	20.7	18.3	13.5	12.6
100,000 and over						5.2	5.2	3.1	4.7	6.2	9.2	13.8	16.3	14.7	10.3	9.8
All sizes	−0.3	−2.6	−0.5	2.1	4.0	5.7	5.5	3.0	5.3	6.8	11.6	16.7	19.1	17.6	13.7	15.2
B After Taxes																
0–49	−21.7	−33.0	−21.1	−15.5	−11.9	−7.6	−9.5	−14.0	−9.4	−8.2	−0.3	3.2	7.4	9.5	9.3	12.2
50–99	−9.1	−14.0	−5.7	−2.9	−1.3	1.6	0.8	1.8	1.0	1.3	6.4	7.0	8.1	9.2	9.6	15.9
100–249	−6.5	−9.9	−4.4	−1.2	0.7	3.8	2.8	0.3	3.1	4.2	7.5	7.8	8.2	8.5	8.5	15.6
250–499	−4.6	−7.4	−3.1	−0.2	1.8	4.6	3.7	1.4	3.9	5.0	8.3	8.0	8.3	8.0	7.6	15.3
500–999	−3.9	−6.4	−2.1	0.2	2.1	4.8	4.0	1.9	4.1	5.0	8.2	8.0	8.3	7.8	7.4	14.9
1,000–4,999	−3.0	−4.8	−1.9	1.0	2.9	5.2	4.8	2.4	5.0	5.5	8.0	8.2	8.6	8.1	7.4	13.4
5,000–9,999	−1.8	−4.0	−1.7	1.2	2.9	5.5	4.9	2.7	5.1	5.2	7.7	7.7	8.8	7.9	7.2	11.9
10,000–49,999	−0.5	−2.7	−0.7	2.5	4.3	5.7	5.8	3.4	5.7	5.8	6.9	8.5	8.5	8.0	7.1	9.9
50,000–99,999	2.2	0.3	0.9	2.8	4.3	6.0	5.3	3.3	4.8	5.9	7.2	8.1	8.6	7.5	6.7	8.2
100,000 and over						4.6	4.7	2.7	4.1	4.9	5.8	7.9	8.2	7.5	6.1	6.9
All sizes	−0.6	−2.8	−0.8	1.7	3.4	4.9	4.6	2.4	4.4	5.0	6.7	8.0	8.3	7.7	6.8	9.9

Source. Bureau of Internal Revenue, *Statistics of Income* the various types of manufacturing corporations do not need to be separated for our purpose here since the main sub-classifications show the same general trend in relation to size as do the totals for all manufacturing corporations. Table 23 sets forth the rates of return both before and after taxes by size of firm for the period from 1931 to 1946 inclusive.[79]

During the depression, the largest manufacturing corporations showed up favorably on a comparative basis, not because they had a good rate of return but because they had not been affected so adversely. This was due in part to the dividends they continued to receive and in part to their diversity of operations. After 1935, however, the corporations of smaller size advanced more rapidly in volume of business and rate of profitability. As war business increased the firms under ten million of assets became the most profitable and, in 1945 and 1946, those with assets under a million dollars had the highest rates of return, before taxes. On an after-tax basis the differences in rates of profit for several of the middle size ranges were very slight. For 1944 and 1945, firms with between $50,000 and $100,000 of assets were the most profitable.

In order to clarify the situation with regard to rates of return it is necessary to separate those corporations reporting taxable net income from those reporting a loss. Table 24 records the position of the profit corporations. It shows that, when only the corporations reporting such profit are considered, the rate of return tends to decrease generally with increasing size, and that the highest rates are found among the profitable small corporations. This has been universally true on an after-tax basis, and reflects in part the lower tax rates on incomes of less than $50,000 a year. Before taxes, however, the situation during the war was different, since many of the smaller corporations which had increased in size during those years were more profitable than either those which had remained small or the new small corporations springing up.

If these corporations had been classified by size as of some prior date the smallest would undoubtedly have remained the most profitable. But classification of income tax figures is as of the size of assets for each year, and this means that the war babies which expanded rapidly and were very profitable increased sufficiently in size to have become medium-sized firms, thus making those classifications the most profitable.

Rates of loss for corporations reporting no taxable income are the

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[79] After-tax figures for manufacturing corporations did not become available until 1939.

TABLE 23.—PERCENTAGE RATES OF RETURN ON NET WORTH FOR MANUFACTURING CORPORATIONS REPORTING SIZE OF ASSETS

Asset Class (thousands of dollars)	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
A. Before Taxes																
0–49	−25.6	−35.5	−20.9	−13.8	−11.1	−6.2	−1.8	−14.6	−9.6	−7.5	5.0	9.6	16.3	18.9	14.8	11.1
50–99	−11.5	−16.1	−5.6	−1.5	0.7	4.3	2.7	1.9	3.1	5.0	14.7	17.4	20.6	20.7	17.8	22.1
100–249	−8.2	−11.3	−2.4	0.7	2.9	7.3	5.6	1.2	6.2	8.9	19.3	22.5	25.0	23.9	19.5	26.0
250–499	−5.7	−8.6	0.3	2.5	4.8	8.9	7.2	2.6	8.3	10.9	23.1	27.2	28.9	27.1	21.7	29.0
500–999	−3.9	−6.6	1.0	3.2	5.9	5.0	8.1	3.6	8.5	11.7	24.3	31.0	30.4	30.5	24.2	30.2
1,000–4,999	−3.1	−5.5	1.4	3.8	6.7	10.5	9.6	4.1	9.8	13.6	25.0	32.1	34.0	31.3	23.3	26.6
5,000–9,999	−1.1	−3.8	2.3	4.8	7.0	10.9	9.1	4.3	9.6	13.3	25.5	32.1	34.7	29.7	20.9	22.9
10,000–49,999	−0.4	−3.9	1.7	4.1	7.5	10.2	10.0	4.6	9.8	12.9	22.3	31.6	34.1	28.6	19.8	18.8
50,000–99,999	−2.1	−0.0	1.7	4.4	7.4	10.9	9.1	5.6	8.9	14.8	26.0	27.6	32.7	26.8	17.5	15.4
100,000 and over						8.7	9.3	4.0	7.4	10.9	17.5	16.9	19.7	16.5	9.4	9.9
All sizes	−0.6	−3.3	1.2	3.7	6.6	9.5	8.9	3.9	8.4	12.0	20.3	24.6	27.1	23.4	15.9	17.0
B. After Taxes[a]																
0–49	...	...	...	...	...	...	...	−15.5	−10.9	−9.1	1.0	3.3	8.3	11.2	8.4	5.3
50–99	...	...	...	...	...	...	...	−2.8	1.7	3.0	9.5	9.0	10.1	11.4	10.4	15.1
100–249	...	...	...	...	...	...	...	0.2	4.7	6.3	12.0	10.6	10.7	10.8	9.5	16.3
250–499	...	...	...	...	...	...	...	1.5	6.5	7.7	12.7	11.2	11.0	10.2	8.7	17.3
500–999	...	...	...	...	...	...	...	2.4	6.7	8.1	13.3	11.9	10.5	10.5	8.7	17.8
1,000–4,999	...	...	...	...	...	...	...	3.0	7.9	9.5	13.2	12.1	11.7	10.4	8.4	15.8
5,000–9,999	...	...	...	...	...	...	...	3.3	7.9	9.2	12.6	12.1	11.7	10.1	7.7	13.7
10,000–49,999	...	...	...	...	...	...	...	3.7	8.2	9.1	11.2	11.7	11.6	9.6	7.3	11.3
50,000–99,999	...	...	...	...	...	...	...	4.5	7.3	10.7	13.1	10.7	11.2	9.2	6.8	9.2
100,000 and over	...	...	...	...	...	...	...	3.4	6.3	8.0	9.5	7.4	8.0	6.9	4.5	5.6
All sizes	...	...	...	...	...	...	...	3.0	6.9	8.5	10.2	9.8	9.9	8.6	6.4	10.3

Source: Bureau of Internal Revenue, *Statistics of Income*.

[a] Data for 1931-37 not published.

TABLE 24.—PERCENTAGE RATES OF RETURN ON NET WORTH FOR MANUFACTURING CORPORATIONS REPORTING TAXABLE INCOME

Asset Class (thousands of dollars)	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
A. Before Taxes																
0–49	11.8	10.4	10.2	12.6	12.9	15.2	15.5	13.6	14.7	15.7	23.0	26.1	29.5	31.4	28.5	33.5
50–99	9.3	8.0	9.1	11.0	11.6	13.7	13.5	12.0	13.8	15.0	21.8	24.2	26.7	26.8	24.0	31.7
100–249	8.6	8.0	9.5	10.9	11.9	14.1	13.7	11.7	13.6	15.5	19.9	26.6	29.0	27.9	23.7	32.7
250–499	8.7	7.7	9.6	11.1	12.1	14.2	13.4	10.7	13.5	15.6	24.9	30.0	31.6	29.8	25.1	34.4
500–999	8.7	7.9	9.9	11.2	12.6	8.4	13.6	10.6	13.0	16.1	26.8	33.0	32.2	32.7	27.2	35.0
1,000–4,999	8.5	7.6	8.8	9.9	11.7	13.7	13.4	9.6	12.7	16.0	26.3	33.3	35.5	32.8	25.6	31.1
5,000–9,999	9.8	8.6	9.5	10.4	11.7	13.4	12.2	9.1	11.8	15.0	26.2	33.0	35.6	31.0	22.6	26.3
10,000–49,999	8.2	6.9	8.5	8.9	11.4	11.7	11.5	7.8	11.1	14.0	22.9	31.8	34.5	29.0	21.2	22.2
50,000–99,999	8.8	6.0	4.9	8.3	10.0	11.7	10.3	9.2	10.1	15.5	26.0	27.7	33.1	27.4	18.9	18.4
100,000 and over						9.5	9.7	7.1	8.3	11.4	17.6	17.3	19.7	16.6	10.0	10.4
All sizes	8.7	6.8	7.0	9.4	11.0	11.7	11.3	8.4	10.6	13.7	22.2	25.5	27.7	24.1	17.4	20.2
B. After Taxes[a]																
0–49								11.7	12.6	13.2	18.0	18.2	20.1	22.5	20.9	26.2
50–99								10.2	11.8	12.2	15.7	14.4	14.8	16.3	15.6	23.6
100–249								9.9	11.5	12.1	15.2	13.4	13.4	13.6	12.7	22.0
250–499								9.0	11.2	11.7	14.7	13.0	12.6	11.9	11.0	21.7
500–999								8.9	10.8	11.8	15.0	13.0	11.5	11.7	10.6	21.7
1,000–4,999								8.0	10.5	11.5	14.1	12.8	12.4	11.2	9.7	19.2
5,000–9,999								7.6	9.8	10.6	13.1	12.5	12.1	10.7	8.8	16.3
10,000–49,999								6.6	9.3	9.9	11.5	11.8	11.7	9.8	8.0	13.9
50,000–99,999								7.7	8.4	11.2	13.1	10.7	11.4	9.5	7.6	11.6
100,000 and over								6.1	7.1	8.3	9.6	7.6	8.0	6.9	4.9	6.8
All sizes								7.1	8.9	10.0	11.8	10.3	10.3	9.0	7.3	12.8

Source: Bureau of Internal Revenue, *Statistics of Income*.

[a] Data for 1931-37 not published.

TABLE 25.—PERCENTAGE RATES OF LOSS ON NET WORTH FOR MANUFACTURING CORPORATIONS REPORTING NO TAXABLE NET INCOME

Asset Class (thousands of dollars)	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
0–49	52.3	46.8	36.7	36.3	35.6	35.2	43.7	40.0	48.0	52.0	63.4	56.5	55.1	62.4	62.0	75.8
50–99	25.6	22.9	15.8	15.3	14.3	15.2	16.3	17.3	19.3	20.5	24.6	22.1	24.7	26.9	26.0	39.1
100–249	19.5	17.3	12.2	11.7	12.0	11.2	12.5	13.8	14.0	14.9	14.3	14.2	18.7	18.3	22.3	35.4
250–499	15.1	14.5	8.7	9.8	8.9	9.2	9.3	10.6	11.5	10.4	12.7	13.5	14.5	17.5	19.7	31.5
500–999	12.1	12.1	8.4	8.6	8.3	9.2	9.0	9.2	8.9	12.3	11.8	9.2	12.9	13.0	19.3	31.7
1,000–4,999	10.2	10.0	7.0	6.2	5.5	7.0	6.2	6.8	7.3	7.7	8.2	11.3	9.9	10.6	13.6	22.4
5,000–9,999	8.1	9.1	5.6	4.8	5.2	4.7	5.4	5.8	3.4	5.8	15.7	7.7	3.7	4.1	11.9	18.3
10,000–49,999	7.3	8.3	6.3	4.1	2.6	4.7	3.2	4.5	2.8	4.7	2.8	3.4	3.9	8.4	5.1	13.9
50,000–99,999	2.6	3.0	2.3	6.6	0.0	3.5	5.0	3.7	5.2	1.7	5.1	20.3	17.5	4.0	6.2	12.5
100,000 and over						1.3	2.2	3.3	1.6	0.7	2.8	3.0	....[a]	0.0	1.9	8.4
All sizes	7.1	7.6	5.5	4.5	4.3	7.0	7.8	6.2	6.8	8.7	11.8	11.1	14.6	12.4	8.4	16.3

Source: Bureau of Internal Revenue, *Statistics of Income.*

[a] Deficit in net worth.

TABLE 26.—PERCENTAGES OF MANUFACTURING CORPORATIONS REPORTING NO TAXABLE NET INCOME, 1931-1946

Asset Class (thousands of dollars)	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
0–49	68.8	86.8	79.1	72.2	69.8	64.3	68.4	72.9	65.4	60.5	47.3	43.0	35.0	33.3	35.2	42.0
50–99	64.7	81.2	64.8	54.9	50.2	40.6	45.8	54.4	33.4	36.5	22.6	20.3	16.7	16.8	17.5	20.9
100–249	64.0	79.3	59.5	51.3	44.9	33.1	38.3	47.4	33.4	27.7	14.5	13.0	11.6	11.2	12.4	14.7
250–499	64.8	76.2	54.9	47.5	40.3	28.1	31.8	42.5	25.7	21.6	9.5	8.6	7.3	7.0	9.9	11.0
500–999	63.7	75.0	52.4	45.0	37.6	24.4	28.8	40.0	24.6	19.5	8.0	5.9	5.3	5.6	8.2	10.1
1,000–4,999	64.7	75.8	51.3	43.0	34.0	20.4	23.6	38.3	19.7	13.9	5.4	4.1	3.9	4.2	6.7	10.2
5,000–9,999	63.6	72.2	52.4	41.6	31.8	16.3	20.1	34.7	16.4	10.4	3.2	3.0	2.6	3.4	6.1	9.0
10,000–49,999	60.5	74.4	50.2	40.0	31.2	13.9	13.8	28.3	11.6	7.1	2.8	1.3	1.2	1.3	5.8	10.9
50,000–99,999	54.7	60.7	48.7	43.0	33.3	8.1	10.6	31.8	12.5	3.8	1.1	1.1	1.9	1.8	7.3	10.9
100,000 and over						13.9	6.5	34.7	11.7	6.2	1.1	1.8	0.8	0.8	5.8	10.3
All sizes	66.3	82.6	69.1	61.3	56.9	48.2	52.6	59.8	48.1	42.7	28.6	24.9	19.8	18.6	20.4	24.6
Per cent of assets in "no income" category	61.5	72.4	49.2	44.9	34.2	17.1	15.9	35.7	15.8	9.8	3.6	2.9	2.1	2.1	6.3	10.0

Source: Bureau of Internal Revenue, *Statistics of Income.*

most illuminating. They are very high for the small corporations and decrease rapidly as size increases. This situation exists in all stages of the business cycle and means that, under ordinary circumstances, medium-sized and larger corporations appear to be more profitable not so much because of the high income of profit corporations but primarily because of the extreme unprofitableness of such a large segment of the small corporations.

Table 25 shows the rates of loss on net worth for manufacturing corporations reporting no taxable net income. It is rather surprising to note that unprofitable corporations have been especially unprofitable since 1940 and that their rates of loss during and since the war have been very high. This does not mean, however, that there has been a greater total amount of unprofitable operation. Percentages in Table 26 indicate that although companies suffering a loss during the war were very unprofitable their number declined to a low of 20.4 percent of all manufacturing corporations in 1945, and then increased noticeably with the end of war business to 24.6 percent for 1946; but the proportion of assets involved was only 10.0 percent of the total. As indicated in this same table the small corporations have a much larger proportion of their numbers in the no-income category for all years. Eighty-six percent of the smallest corporations incurred a loss in 1932, as compared with sixty percent of the largest firms. This proportion declined to a low of one-third for the smallest corporations in 1944 and was less than one percent for corporations with assets in excess of 100 million dollars.

VI. VARIATIONS CHARACTERISTIC OF CORPORATIONS OF DIFFERENT SIZE

There are certain adjustments that can be made in income tax figures and innumerable others that would be desirable if the data could be so adjusted. From all available evidence, however, it may be concluded that such adjustments would not change basically the general results which indicate that, when all manufacturing corporations are included, the highest rate of return is received by medium-sized corporations, i.e., those with total assets of less than the maximum size. The specific size classification that is most profitable depends very largely on the proportion of no-income corporations which, in turn, varies with the level of business activity.

What conclusion can be drawn from the fact that the large corporations have this lower average rate of profit in relation to their net worth? Does it mean, as the Federal Trade Commission has suggested, that the large firms have really passed the point of optimum efficiency?

This may ultimately prove to be true but, as pointed out in a previous chapter, there is at present no evidence to support the conclusion that large firms are less efficient than small ones. Furthermore, the situation is complicated by the fact that for those corporations which use their capital effectively, i.e., the income corporations, diminishing returns (as measured by relative profitability) begin at some asset size less than $50,000, since the rate of return for income corporations larger than that decreases with increasing size.

Aside from the difference in average rate of return on net worth, however, there are numerous variations which characterize corporations of different size. These will be discussed prior to further comment on relative profitability and are the subject matter of this chapter.

Dispersion of Income

When averages are employed it is easy to lose sight of variations in figures. Average rates of profit taken as a whole or with a separation of income and no-income corporations do not show the degree of variation in profits and losses within each group.

As a general rule, small corporations show much wider extremes of profit or loss than do larger corporations. The latter, whether they are profitable or unprofitable, exhibit a greater degree of concentration near zero, while the former show a much larger percentage of profit or loss in relation to net worth.[80] Regardless of the average rate of return

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[80] The greater proportion of smaller firms enjoying a high rate of profit is illustrated by a study of 4,644 trading and manufacturing concerns for the years

TABLE 27.—PERCENTAGE DISTRIBUTION OF 563 COMPANIES BY EARNING RATES ON CAPITAL FOR DIFFERENT ASSET CLASSES

(Ratio of three-year aggregates, 1927-1929)

Asset class	Number of companies	Earning Rate					Average rate of earnings
		Loss	0-10%	10%-20%	20%-30%	Above 30%	
			A. Manufacturing				
0-$500,000	131	9.9	42.0	29.8	13.0	5.3	11.0
Above $500,000	210	7.1	61.9	23.3	6.7	1.0	8.0
Total, manufacturing	341	8.2	54.3	25.8	9.1	2.6	9.2
			B. Trading				
0-$500,000	127	14.2	71.6	9.4	2.4	2.4	5.9
Above $500,000	95	5.3	75.8	17.9	1.0	0.0	7.0
Total, trading	222	10.4	73.4	13.1	1.8	1.3	6.3

Source: W. A. Paton, *Corporate Profits as Shown by Audit Reports* (New York: National Bureau of Economic Research, Inc., 1935), p. 73.

TABLE 28.—PERCENTAGE DISTRIBUTION OF 5,840 COMPANIES BY EARNINGS OR LOSS RATES ON CAPITAL FOR DIFFERENT ASSET CLASSES, 1928

Asset class	Number of companies	Earning or Loss Rate							Average rate of earnings or loss
		Below 5%	5%-9%	10%-14%	15%-19%	20%-49%	50%-99%	100% and over	
A. Manufacturing									
		1. Percent of income to investment (income corporations)							
0–$300,000	1,973	27.9	22.3	14.2	9.3	19.6	4.3	2.4	13.9
Above $300,000	322	29.5	24.2	16.2	13.3	14.6	2.2	0.0	14.5
		2. Percent of loss to investment (no-income corporations)							
0–$300,000	1,059	32.1	17.6	11.2	6.9	19.2	6.9	6.0	16.1
Above $300,000	86	47.6	19.8	7.0	12.8	10.5	2.3	0.0	10.6
B. Retail Trade									
		1. Percent of income to investment (income corporations)							
0–$300,000	1,609	29.5	24.7	16.7	9.6	14.9	2.9	1.7	4.8
Above $300,000	46	21.8	34.8	28.2	10.9	4.3	0.0	0.0	9.6
		2. Percent of loss to investment (no-income corporations)							
0–$300,000	741	31.9	18.2	12.5	8.4	16.2	7.3	5.5	13.3
Above $300,000	4	75.0	25.0	0.0	0.0	0.0	0.0	0.0	3.1

Source: *Book Investments and Taxable Incomes of Wisconsin Mercantile and Manufacturing Corporations, 1928.* Wisconsin Tax Commission, Bulletin No. 45, October, 1931.

on invested capital, the spread of profit or loss rates is greater for the small corporations.

Comments on this condition have been outlined from a deductive point of view,[81] and a few investigations have produced data which illustrate the situation.[82]

For two studies data have been collected by range of income or loss on invested capital by size groups. In Table 27 a group of manufacturing and trading companies is classified separately into two sets of corporations; one with capital of less than $500,000, and the other with capital in excess of that amount. It is evident from the table that more of the small firms had no net income, while of those with net income a larger number received in excess of a 10 percent return on invested capital. In terms of averages the small manufacturing companies had a higher return than did the larger ones, but this situation was reversed for the trade category.

In the second investigation, data are available to show not only the larger number of small companies which received higher rates of return but also the degree to which they suffered more severe losses. (See Table 28.)

Regardless of the average profitability of large as compared with small corporations, the range between high and low profits and large and small losses is greater for the small businesses.[83] This reflects the stability of earnings among large corporations as compared with the extreme degree of variation found in small corporations.

1918 to 1923 inclusive (National Industrial Conference Board, *The Shifting and Effects of the Federal Corporation Income Tax,* Vol. I, 1928, pp. 36-39). These corporations had all received income of $100,000 or more during at least one of the years covered by the study. The highest average investment was generally found among the corporations earning less than 10 percent on capital investment. It decreased successively for those earning 10.0 to 14.9 percent and 15.0 to 19.9 percent, with the lowest average capital being employed by the firms earning 20.0 percent or more.

[81] George and Tebeau, *loc. cit.,* pp. 11-22.

[82] Joseph L. McConnell, using a sample of 500 corporations with assets of less than $250,000, illustrated the extreme dispersion of income by quartile interval groups for firms with less than $20,000 of assets as compared with successively lesser degrees of dispersion for asset groups of $20,000 to $49,000, $50,000 to $99,000, and $100,000 to $249,000 ("1942 Corporate Profits by Size of Firm," *loc. cit.,* pp. 15-16).

[83] For an index of variability based on *Statistics of Income* for 1936, see Crum, *Corporate Size and Earning Power,* pp. 330-338.

Note also: S. S. Alexander, "The Effect of Size of Manufacturing Corporation on the Distribution of the Rate of Return," *Review of Economic Statistics* 31:231-253 (August, 1949).

Stability of Income and Continuity of Business

Both collectively and individually, large corporations enjoy a stability of income not evidenced by small corporations. The rate of return of the former does not drop so low in a depression and does not rise so rapidly in a prosperous period. Even more important for the investor than average returns for all corporations is the relative certainty of income for the individual corporation.

When *Statistics of Income* figures show the average rate of return on net worth over the years, the data are not strictly comparable since those for the smaller corporations apply to a different group each year, because of a rapid turnover with the entrance of new businesses and the elimination of unprofitable enterprises. For the larger corporations, on the other hand, the size classifications may change somewhat from time to time and new corporations reach those sizes; but most of the corporations are the same year after year.

Even if the small business proves successful, a part of its profit is really a relatively short-run return, since the ability of the owner-operator, although not a depreciable asset, is certainly an aging one. In the larger concern there is more outside ownership of stock and the major officers are periodically replaced for continuation of the business without serious interruption.

For the large corporation survival is not based on a single transaction or the results of a single year. Sufficient assets are available to weather a much more severe economic crisis. Nor is activity so specialized in a big business. Varied types of production and different products make it possible to combine risks and offset losses in one phase of operations against the profits of another activity of the large firm. The filing of consolidated tax returns for tax purposes, moreover, allows a parent organization to balance against each other the profits and losses of different subsidiaries. Dividends from investments also help to stabilize the income of the large corporation.

Uncertainty in business decreases with an increase in the size of the business unit. Failure is much more common among small businesses than in large enterprises, both in relation to the number of corporations in each category and in relation to the proportion of assets of each group involved in losses. That is, a smaller percentage of the large corporations fail, and the assets involved in those failures are smaller in proportion to the total assets in that category.

The extensiveness of failure of small business is illustrated also by the fact that the number of small firms remains very nearly constant in relation to the population, and yet the number entering the field each year is large. Although many of these firms are not involved in bankruptcy, and some of them may have been acquired by other firms because of their profitableness, it seems most likely that the majority of discontinuances result from a distinct lack of profitable operation.

Further evidence on this subject is shown by the lower rates of profit realized by small business, and particularly by the big losses of no-income corporations. Also, the proportion of these no-income corporations is very high for the small firms. Presumably the continuation of this no-income position soon ends in failure. When the large corporation fails it is ordinarily reorganized, but the small firm will usually go out of existence and its assets will be liquidated. This involves economic loss not only to the owners but a possible loss in terms of production, employment, and purchasing power.

Rate of Profit on Sales and Capital Turnover

Ordinarily, the rate of profit on sales for manufacturing corporations increases directly with the size of the business unit, at least until fairly large size is reached. Only in rather depressed periods do the largest corporations have the highest rate of profit — or the lowest rate of loss. As shown in Table 29, income corporations show much the same trend as all corporations, but no-income corporations do not exhibit any consistent tendency, except that the rate of loss is especially low for the largest classification.

Table 30 indicates that the rate of turnover of assets varies inversely with size, being the highest for small corporations and the lowest for the giants. This is true of every phase of the business cycle, although of course the rate of turnover for each category is higher during prosperous business intervals. It applies to both income and no-income corporations, with the former having a more rapid turnover than the latter for the same year in each size group.

This rapidity of turnover of the smaller corporations makes them more flexible. When business expands their sales and profits move up rapidly, and fewer of them suffer losses. But reverses are accentuated also; losses are incurred on more units and the number of no-income companies mounts sharply.

Significance of Officers' Compensation

Small corporations with stock closely held by a few officers tend to adjust the salaries of those officers to reflect general changes in business conditions and their own net profits. Sometimes this is done merely by changing the annual salary, but often it is accomplished

TABLE 29.—PERCENTAGE RATES OF BEFORE-TAX PROFIT OR LOSS ON GROSS SALES AND GROSS RECEIPTS FROM OPERATIONS OF MANUFACTURING CORPORATIONS, SELECTED YEARS

Asset Class (thousands of dollars)	All companies				Companies with net income				Companies with no net income			
	1932	1939	1943	1946	1932	1939	1943	1946	1932	1939	1943	1946
0–49	−10.9	−1.5	2.5	1.9	3.0	2.9	4.8	6.2	−14.6	−5.8	−6.8	−10.6
50–99	−8.3	0.8	4.7	5.0	3.2	3.7	5.9	7.1	−13.0	−5.6	−6.8	−8.9
100–249	−8.0	2.2	6.4	6.5	4.1	4.6	7.3	8.1	−13.7	−5.4	−5.9	−9.6
250–499	−7.8	3.6	8.2	8.0	4.9	5.6	8.8	9.4	−15.4	−5.8	−5.4	−10.2
500–999	−7.3	4.4	10.0	9.1	6.2	6.4	10.5	10.4	−15.6	−5.6	−5.8	−11.6
1,000–4,999	−7.5	6.3	12.0	10.1	7.5	8.0	12.4	11.6	−15.8	−5.3	−5.2	−11.3
5,000–9,999	−6.1	8.2	14.1	11.3	9.7	9.8	14.3	12.7	−17.3	−3.3	−4.1	−12.3
10,000–49,999	−7.0	9.0	14.3	10.2	8.5	10.1	14.4	11.5	−18.3	−3.1	−3.7	−10.1
50,000–99,999	−0.05	7.7	12.6	9.0	7.6	8.6	12.9	10.4	−6.6	−5.9	−3.3	−10.3
100,000 and over		7.8	10.8	6.6		8.9	10.9	7.8		−1.5	−1.4	−6.4
All sizes	−4.8	6.3	11.5	8.5	7.2	8.1	11.8	10.0	−12.8	−4.4	−4.8	−9.4

Source: Bureau of Internal Revenue, *Statistics of Income.*

TABLE 30.—PERCENTAGES SHOWING ANNUAL TURNOVER OF ASSETS[a] FOR MANUFACTURING CORPORATIONS, SELECTED YEARS

Asset Class (thousands of dollars)	All companies				Companies with net income				Companies with no net income			
	1932	1939	1943	1946	1932	1939	1943	1946	1932	1939	1943	1946
0–49	169	259	325	301	231	296	357	337	158	232	240	228
50–99	120	204	269	264	181	239	289	288	106	154	163	171
100–249	96	179	249	244	151	203	261	259	82	131	155	155
250–499	81	158	230	229	127	174	237	240	66	112	143	141
500–999	71	139	213	213	105	153	217	223	57	95	126	125
1,000–4,999	57	116	184	178	84	124	187	187	48	80	106	107
5,000–9,999	48	90	160	144	73	98	163	150	38	70	57	89
10,000–49,999	43	85	152	135	67	87	153	140	34	62	67	88
50,000–99,999	42	86	159	123	63	91	160	127	33	46	134	84
100,000 and over		73	118	97		73	117	97		69	320	93
All sizes	52	100	151	140	75	101	151	144	43	89	141	105

Source: Bureau of Internal Revenue, *Statistics of Income.*

[a] Percentage of gross sales and gross receipts from operations to total assets.

through a more official agreement or contract with the corporation providing for a bonus or sliding scale tied to sales or net income (usually before taxes). Regardless of the form of adjustment there is a tendency for such corporations to understate their profits during more prosperous periods such as World War II, for example, by absorbing a part of earnings in officers' salaries. This means that the rate of return derived from *Statistics of Income* is understated for the profitable small corporations, especially in high income periods.[84] It is not quite so clear that the process works both ways, with losses being understated in periods of depression, but this may be the case to a moderate degree.

Analysis of war profits for renegotiated companies in 1943 shows that the salaries of officers increased in proportion to the increases in volume of wartime business for the smaller companies, while they did not so increase in the larger companies whose control was in the hands of outside stockholders.

Professor J. L. McConnell made a study of salaries paid to officers in small firms with closely held stock holdings compared with salaries paid where outsiders held the controlling interest. On this basis, he concluded that extensive adjustments in the average rate of return reported for the smaller corporations were in order if the bases of profit computation were to be comparable. In fact, he concluded that:

> In summary, the reporting of a small net loss in several successive years by all corporations having assets below 50 thousand dollars, or between 50 thousand dollars and 100 thousand dollars, is not necessarily inconsistent with a moderate prosperity among this group of firms.[85]

On the other hand, Joseph Steindl objected to the whole procedure of adjusting officers' compensation, stating:

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[84] Professor Crum considered this question but concluded that no more than minor adjustments were in order, stating: "That more than a very slight fraction of the salary of such an officer should be considered as anything but one of wage costs of the business seems to me a view bordering upon absurdity. . . . I rest my case on the conviction that most of the salaries of officers of small companies must be merely wages, and that a smaller share of salaries in smaller companies than in large should be regarded as profits, and on the undoubted fact that executives are less fully covered in the tabulations showing compensations of officers for large companies than for small." (*op. cit.*, pp. 314, 315, 317)

[85] "Corporate Earnings by Size of Firm," *loc. cit.*

The reclassification of a portion of officers' salaries is carried to the extreme by S. S. Alexander, who considers a reasonable rate of compensation to be that paid per dollar of total assets by the no-income corporations. The balance was added back to income for 1937, and this resulted in the same general level of return on net worth for all corporations of $100,000 or more, compared with a peak of return at the $1,000,000 as found by McConnell. (Alexander, *loc. cit.*, pp. 233-235.)

The market of the officers' work is determined on the basis of the average salary paid to officers in those corporations where there is a sufficient dispersion of stockownership. This "market rate" is for the three smaller size classes respectively, $2,000, $4,000, and $6,000 per officer in 1939. I suggest that the lower remuneration of officers in the companies mentioned is not due to control of stock-holders, but to a bias. The dispersed ownership in small companies is a symptom of weaker financial position as compared with small companies in which the owner-officers hold all the stock. This explains why owner-officers in these companies can allow themselves only very low salaries. Further, the strong increase in the assumed "market value" of officers' services with increase in the size of the corporation cannot be wholly explained by greater qualifications of owner-officers who serve the larger corporations. It seems that in Mr. McConnell's adjustment differences in profit rates are being concealed behind differences in "market value" of the work rendered by the owner-officers. It seems to me that the adjustment thus obtained is a distortion and that the unadjusted figures as used by Mr. Crum are much nearer the true picture.[86]

Disbursement of Earnings

When all manufacturing corporations are considered the small corporations pay out a larger share of their earnings in cash dividends than do the medium-sized corporations, but a smaller proportion than do the largest corporations. The latter, in 1946, disbursed 94 percent of their profits (after taxes) in the form of dividends. A glance at Table 31, however, will show that the percentages for *all* small corporations are illusory, as indicated by the situation when only profit-

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[86] *Small and Big Business: Economic Problems of the Size of Firms* (Oxford: Institute of Statistics, Monograph No. 1, 1945).

TABLE 31.—PERCENTAGES OF INCOME AFTER TAXES DISBURSED IN CASH DIVIDENDS BY MANUFACTURING CORPORATIONS, SELECTED YEARS

Asset Class (thousands of dollars)	All manufacturing corporations			Manufacturing corporations reporting net income			
	1939	1943	1946	1932[a]	1939	1943	1946
0–49	. . .[b]	32.9	58.4	50.2	31.3	16.1	13.9
50–99	153.0	27.2	19.6	52.7	32.9	21.0	13.5
100–249	71.0	30.0	20.1	53.3	39.3	26.1	16.2
250–499	64.8	32.0	23.4	62.2	47.2	29.8	20.0
500–999	64.4	32.2	23.6	66.5	50.6	30.6	20.6
1,000–4,999	64.8	34.2	28.0	73.0	57.1	33.2	24.3
5,000–9,999	64.4	36.5	38.1	80.9	60.7	36.2	33.6
10,000–49,999	67.2	40.6	47.5	87.9	65.1	40.5	40.9
50,000–99,999	77.5	45.8	59.6	114.0	73.4	45.2	49.5
100,000 and over	80.4	53.0	94.0		78.6	52.8	80.3
All sizes	72.7	43.0	48.5	93.1	64.9	42.1	41.1

Source: Bureau of Internal Revenue, *Statistics of Income.*
[a] Net income before taxes.
[b] Net loss.

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able corporations are compared. Here it becomes evident that, whether in depression, when the smallest firms reporting a net income disbursed 50 percent of their earnings, as compared with dividends in excess of earnings for the largest businesses, or in 1946 when only 14 percent of the income of the small and 80 percent of that of the largest was so distributed, the latter corporations pay out a larger proportion of their earnings in dividends. Unfortunately, a considerable share of the extensive reinvestment of the profitable small corporations is offset by the losses of the unprofitable midgets, while outright failure plagues them still further.

Effective Tax Rates

For corporations with income totaling less than $50,000 a year the tax rate has been lower than that for larger corporations. This is illustrated in Table 32, which shows the effective tax rates for those manufacturing corporations reporting a net income. But there are many small firms which suffer losses and, when these are combined with the income corporations, the small firms as a group pay higher total taxes in relation to their income (except for the war period) than do the larger businesses. This situation becomes less pronounced in a prosperous period and is aggravated as the proportion of no-income corporations increases.

TABLE 32.—EFFECTIVE TAX RATES FOR MANUFACTURING CORPORATIONS, SELECTED YEARS

Asset Class (thousands of dollars)	All companies			Companies with net income		
	1939	1943	1946	1939	1943	1946
0–49	[a]	49.0	51.9	13.9	32.1	21.7
50–99	44.1	50.9	31.7	14.5	44.5	25.6
100–249	25.1	57.4	37.3	15.7	53.9	32.9
250–499	21.9	62.2	40.2	17.0	60.3	36.9
500–999	21.1	65.4	40.9	17.4	64.2	38.0
1,000–4,999	19.2	65.7	40.8	17.3	65.2	38.2
5,000–9,999	17.8	66.3	40.3	16.9	66.0	37.9
10,000–49,999	16.8	66.0	40.0	16.4	66.0	37.4
50,000–99,999	17.2	65.8	40.1	16.5	65.5	37.1
100,000 and over	14.6	59.7	36.8	14.3	59.6	34.2
All sizes	17.6	63.5	39.5	16.1	63.0	36.5

Source: Bureau of Internal Revenue, *Statistics of Income*.
[a] Loss before taxes.

Sources and Cost of Capital

Small corporations have customarily had difficulty in obtaining funds, since investment of this character has been subject to a con-

TABLE 33.—PERCENTAGES OF TOTAL ASSETS OF MANUFACTURING CORPORATIONS FURNISHED BY STOCKHOLDERS, SELECTED YEARS

Asset Class (thousands of dollars)	All companies				Companies with net income				Companies with no net income			
	1932	1939	1943	1946	1932	1939	1943	1946	1932	1939	1943	1946
0–49	52.0	40.8	50.7	52.2	67.5	58.1	58.5	62.6	49.2	27.8	29.4	31.8
50–99	62.5	56.1	60.8	59.0	72.4	63.6	64.0	64.2	60.2	45.0	44.5	39.0
100–249	67.7	62.6	64.0	60.9	77.1	68.5	65.8	64.0	65.2	50.7	49.1	42.0
250–499	72.7	68.1	65.3	63.1	80.1	72.3	66.2	65.3	70.3	55.9	53.4	45.7
500–999	75.9	71.5	70.0	64.4	82.5	75.3	70.7	66.4	73.7	59.8	56.0	46.0
1,000–4,999	77.8	74.4	64.9	67.7	83.6	78.3	65.3	69.4	76.0	57.6	55.7	53.8
5,000–9,999	76.1	78.7	65.1	71.1	82.8	80.6	65.2	72.3	73.6	68.7	61.5	59.7
10,000–49,999	77.8	78.0	63.6	72.2	81.5	79.1	63.6	73.1	75.1	69.1	63.7	64.0
50,000–99,999	73.9	75.1	60.5	71.8	79.4	77.9	61.2	72.2	71.5	52.8	25.1	68.4
100,000 and over		77.0	64.5	72.5		78.8	64.7	72.6		62.3	....[a]	71.2
All sizes	74.5	74.8	64.0	70.2	80.5	77.9	64.4	71.2	72.2	58.5	46.8	60.8

Source: Bureau of Internal Revenue, *Statistics of Income*.

[a] Deficit in net worth.

siderable degree of risk. This does not mean that the small firms have obtained a larger proportion of their funds through equity financing, for this is not the case, but it has resulted in costly financing. Table 33 shows that, while the large corporations have furnished as much as two-thirds or three-fourths of their assets through original and reinvestment of stockholders, only about half of the assets of the smallest companies have been so provided. The proportion of equity financing for corporations reporting a profit is higher than for those suffering a loss. This would suggest that the less profitable corporations have found it especially difficult to obtain equity capital.

Smaller corporations have been forced to borrow more extensively and thus assume greater risks than the more secure larger corporations (it does not appear that they have done this trading on equity by choice), but their borrowing has been done on a short-time rather than a long-term basis. But this borrowing has been expensive since their rates of interest, even on the short-term loans, have been much higher than those for large firms on long-term loans, and they have been excluded from the market for low-interest-rate, long-term funds. Table 34 shows that small firms have only about half as large a proportion of their borrowing in the form of long-term loans. Thus the smaller firms not only borrow more than the large ones but they pay higher interest rates and borrow on a more risky short-term basis, although it is quite obvious that only a fraction of these loans are used for short-term, self-liquidating purposes. This condition reflects itself in lower current ratios for small business.

Furthermore, as set forth in Table 35, the cost of acquiring long-term funds is much greater for small businesses. Data compiled by the Securities and Exchange Commission for 1945-1947 indicate that the cost for all flotations was only 2.5 percent of the gross proceeds but amounted to 21.9 percent for the smallest flotations. Bond issues ranged in cost of flotation from 5.8 percent for the smallest issues to 1.0 percent for the largest. Preferred stock had a variation from 22.6 percent down to 2.3 percent, while common stock sales in amounts of less than $500,000 had a cost equalling 27.9 percent of the gross proceeds. In addition, the small firms are required to pay a higher rate of interest on their bonds and must offer a higher rate of dividend on their preferred stock.

When the actual costs of securing capital for the period 1945-1947 are compared by size of firm (disregarding the type of security issued), the cost for corporations with assets of less than one million dollars totalled 16.9 percent of the gross proceeds, with costs decreasing with

TABLE 34.—PERCENTAGES OF BORROWED CAPITAL[a] OF MANUFACTURING CORPORATIONS CONSISTING OF LONG TERM DEBT, SELECTED YEARS

Asset Class (thousands of dollars)	All companies				Companies with net income				Companies with no net income			
	1932	1939	1943	1946	1932	1939	1943	1946	1932	1939	1943	1946
0–49	13.7	23.2	25.2	25.5	12.5	18.9	23.0	22.3	13.9	25.1	28.2	28.5
50–99	20.4	27.5	25.9	26.8	17.5	22.3	22.9	23.6	20.8	32.4	34.4	32.9
100–249	23.5	28.8	26.0	25.9	20.5	25.1	23.7	24.4	24.0	33.3	35.1	30.7
250–499	29.1	30.6	24.4	26.8	26.7	26.9	22.9	25.5	29.6	36.9	33.8	32.0
500–999	31.4	32.1	24.8	24.8	28.0	27.9	23.5	24.0	32.1	39.5	35.8	28.4
1,000–4,999	41.5	38.6	25.8	27.6	34.0	31.9	24.3	26.7	42.9	51.5	44.1	32.0
5,000–9,999	55.8	47.7	28.6	34.0	53.0	42.1	27.1	33.6	56.3	63.5	62.6	36.4
10,000–49,999	56.5	51.7	26.1	34.2	39.4	49.3	26.3	34.7	60.8	64.8	19.6	31.5
50,000–99,999	58.1	55.2	36.0	37.4	51.3	54.3	32.6	37.4	60.3	58.8	87.9	36.9
100,000 and over		46.3	42.4	50.1		50.6	41.9	51.8		28.2	72.5	32.9
All sizes	48.7	42.9	34.4	38.4	43.4	43.3	33.7	39.4	50.0	41.7	47.9	32.2

Source: Bureau of Internal Revenue, *Statistics of Income.*

[a] Accounts, notes, bonds, and mortages payable.

TABLE 35.—SUMMARY OF COST OF SECURITIES FLOTATION, AS A PERCENTAGE OF GROSS PROCEEDS, BY TYPE OF SECURITY AND SIZE OF FLOTATION, 1945-1947

Size of Flotation (millions of dollars)	All flotations[a]		Bonds		Preferred stock		Common stock	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost
Under 0.5	19	21.9	2	5.8	1	22.6	13	27.9
0.5–1.0	95	15.3	6	8.7	21	11.5	51	18.7
1.0–2.0	136	11.6	11	5.9	29	9.2	61	14.4
2.0–5.0	176	6.6	39	2.9	52	6.3	49	10.1
5.0–10.0	103	4.5	27	2.2	31	4.2	21	7.6
10.0–20.0	71	3.2	32	2.0	19	3.5	8	8.0
20.0–50.0	68	2.1	41	1.6	11	3.4	2	8.2
50.0 and over	47	1.2	39	1.0	2	2.3	..	..
All sizes	715	2.5	197	1.3	166	4.2	205	10.0

Source: Securities and Exchange Commission, "Cost of Flotation, 1945-1947," *Survey of American Listed Corporations* (Washington: February, 1949), p. 10.

[a] Includes 147 flotations unsegregated as to type.

increasing size of business so that the cost was only one percent for firms with assets in excess of $500 million.[87]

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[87] Securities and Exchange Commission, "Cost of Flotation, 1945-1947," *Survey of American Listed Corporations* (Washington: February, 1949), p. 19.

VII. CONCLUSIONS

Success and failure in business are customarily measured in terms of efficiency and profitability. Although other measures or yardsticks of performance, which would attempt to measure social values produced or destroyed from the point of view of society as a whole, have been suggested, such measurements have not as yet been developed in objectively measurable terms. They have been stated rather in terms of general social valuation. Such imponderables are not of much assistance in the effort to measure performance in relation to size of firm, and even the meager efforts forthcoming have not been made on that basis. The measures of performance utilized in this study have therefore of necessity been the commonly accepted ones of efficiency and profitability.

Efficiency in Relation to Size

Efficiency is measured by cost, and that firm is considered most efficient which has the lowest costs, after adjustments for differences beyond the control of the management. Thus, relative costs within the control of the firm rather than absolute costs constitute the significant measure, since the latter are practically meaningless when such noncomparable manufacturing conditions as those in the North and South are compared.

Differences in relative cost are considered in part at least to be a function of size. Unfortunately, the statistical evidence with respect to efficiency is highly conflicting. In some fields the largest businesses appear to be the most efficient; next-to-the largest firms have lower costs in certain industries; and medium-sized firms have shown the lowest costs in other investigations. It seems quite apparent, therefore, on purely economic grounds, why the medium-sized and larger units have become predominant in the principal fields of manufacturing. Mass production is essentially large-scale, and any choice of the most efficient size must be made in terms of sizable units. Small-scale enterprise produces only a minor proportion of the total volume in the basic industries and in most cases has relatively high costs. Although it is not necessary for small businesses to be relatively efficient to continue supplying special services to essentially local markets, their significance is very limited for comparisons on a national scale.

The extreme lack of comparability of figures relating to cost confuses the picture of relative efficiency, since many factors other than size can enter into cost differences. There are geographical, accounting, organizational, wage, and miscellaneous differentials which complicate the issue. In addition, the large firms operate on a nation-wide basis and combine varying costs from scattered areas; some of these costs are likely to be low and some will probably be high. Investigations in the rubber tire and baking industries suggest that lower costs of manufacture by the largest companies may be offset by higher selling and distribution costs. The data are confused, moreover, by the varying methods of distribution of products and by differences in the proportion of total costs to the consumer which may have been included or excluded.

Cost figures have usually been compiled for too short a term of years to include periods of both prosperity and depression. If they were so extended, it is probable that some of the larger companies would make a better comparative showing because of their greater degree of stability and continuity. On the other hand, the more highly integrated corporations, with extensive properties supplying raw materials, sometimes find that such capacity results in rather high average costs because of idleness during a depression. Even if the integrated firms have low book cost, they are sometimes also low-profit corporations in terms of rates of return on their more extended net worth.

Furthermore, costs are partly a matter of allocation to specific products, and differences in the application of overhead rates make the same firm low-cost in some products and during certain business periods, but high-cost in others. One business may have spent twenty years developing a product, the developmental costs of which were charged off in prior years, whereas another company may be writing off those expenses currently. A large corporation which maintains its own repair and maintenance departments has a greater opportunity to charge to current operations many of its essentially capital outlays, but a smaller corporation may neglect to inventory some of its tools and supplies. The total of such capital outlays charged off currently has averaged more than $2 billion a year since the war.

Still another unsolved problem confronts the analyst of efficiency. Even if a large firm, which represents many mergers and additions, were the most efficient in terms of having the lowest costs in those factors within the control of the management, it would probably not have the lowest accounting costs. How could it have the lowest costs when the original combination of its components resulted from a grouping of many plants, some of them with low costs, some with medium costs, and others with high costs? Consequently, the very act of consolidation brings together varying degrees of efficiency. It seems almost too much to expect that, even under unusually favorable circumstances, such a company will have the lowest costs of any in the field. The mere act of consolidation cannot be expected to turn a conglomerate of efficiencies into the most efficient form of operation.

A study of consolidations shows that they have not always been concerned with the operating efficiency of the firms which are combined. In the establishment of the United States Steel Corporation, for example, the primary purpose was clearly not that of combining into a giant company either the most efficient or the most profitable units. Rather, the apparent motive, aside from the profits to the promoters, was to eliminate the low-cost competition of the Carnegie Steel Company by combining it with former competitors. Such a combination could not automatically result in low-cost operations. Giant size of itself would not be expected to insure lower-cost operation than that provided by a medium-sized firm which had not acquired high-cost plants. Extraordinary skill would be needed to create relatively low-cost operation out of a combination of low-and-high-cost plants.

Even when ways of improving efficiency were known, it might not be considered advisable for various reasons to undertake the necessary improvements. Furthermore, the larger firms have often considered it desirable to make somewhat uneconomic and perhaps wasteful expenditures for institutional advertising, recreation, and public relations programs. They have landscaped their grounds and attempted to beautify their buildings and offices. Since most combinations have represented such a mixture of circumstances it may be indicative, although not conclusive, of their relatively high degree of efficiency that they have such comparatively low costs as are shown in mass cost comparisons.

Considering all the uncertainties involved, the unsatisfactory conclusion seems inevitable that we do not know very much about relative efficiency in relation to size. Since none of the studies have made the adjustments necessary for valid measurements, the same objection can be raised against all of them whether they show one size or another to be more profitable.

As a generalization from the inadequate data on the subject it may be stated that there is little evidence to support the conclusion that the largest enterprises have been shown to be relatively inefficient, nor, on the other hand, has it been proved that they have a superiority on a cost basis. That they must be aware of the most efficient methods is suggested by the fact that they maintain extensive research and other staff facilities. However, it is sometimes charged that these staff functions impose an undue burden of bureaucratic procedures and encourage a greater degree of inefficiency. Unfortunately, neither side of the argument has successfully assumed the burden of proof or furnished much of a foundation for the establishment of a public policy.

Profitability in Relation to Size

Although the analysis of profitability has been more complete than that of efficiency, the available evidence on the relative rates of return for corporations of different size indicates clearly that the results can vary widely with the use of different samples.

A comparison of the early analyses of Dewing, Mead, and Livermore shows how the matter of interpretation is most significant in comparative relationships. Because of Dewing's methods the same data could be used to "prove" opposing conclusions. On the other hand, to show that the major consolidations stood up favorably as compared with a group of fairly successful businesses, as Livermore did, is not adequate proof of the superiority of such consolidations.

Of somewhat greater validity were the analyses of groups of corporations, such as those conducted by Summers and Paton. But they did not constitute samples of the type from which conclusions about all corporations could be universalized, since they included only firms with a continuous existence over a period of years and were therefore analyses of firms ordinarily receiving a profit. The error involved in drawing conclusions from too narrow a range of data is clearly illustrated by Epstein's investigation of the automobile industry, which concluded that the medium-sized automobile firms were the most profitable. Over a period of years, however, a number of these firms ceased production because of unsuccessful operation and others became less profitable.

By combining industries of different size, the larger of which were very profitable, the Wisconsin study reached the conclusion that the largest corporations were the most profitable; and Crum arrived at the same conclusion from 1926 income tax data when measuring the size of corporations by size of net income. In all probability he would have reached a different conclusion for a profitable year like 1926 if the figures could have been arranged by size of assets.

The difficulty with all these limited studies lies in their special characteristics. If studies of the same firms are continued over a period of years, the results depend on the proportion of small companies and no-profit companies included. Such analyses usually include only profitable small corporations, because no others have continuity. Thus, the businesses that are small at the beginning of the period usually make the best showing, because the effect of a high mortality rate has been eliminated and the data assume the characteristics of growing corporations only. On the other hand, if a large number of small corporations are covered, including those that fail, their rate of return is less and medium-sized corporations are the most successful, because they are the ones with the greatest opportunity for growth.

The danger of universalizing conclusions based on a particular period is amply illustrated by Crum's use of 1931-1936 data to show that large corporations are the most profitable. Had the analysis been continued for another year or two the fallacy of such a conclusion would have become evident.

Furthermore, methods of classification are significant. During the war period, with rising profits, the classification by size of assets for a prior year, 1939, showed small companies to be the most profitable, whereas classification of the same companies by size of assets attained in a later year, 1944, gave different results. The number of small corporations had declined and those which had remained small were the less profitable ones. Medium-sized corporations then made the best showing; they included the most profitable of those which had been classified as small on the 1939 basis of classification.

The remarkably good showing of the largest manufacturing corporations for 1948 and 1949 is somewhat surprising. Until *Statistics of Income* figures become available for those years it will not be clear whether the results arise from the special nature of the corporations included or whether some unusual circumstance has arisen during the postwar period of rising prices to produce this situation.

Statistics of Income data, which are classified by size for each year, show that small corporations are the least profitable but have the greatest degree of variation. They go down faster in a depression and recover faster in prosperity. The more prosperous the period, and the higher the average rate of return for all corporations, the smaller the size group that appears to be the most profitable. In contrast, only in the depth of depression, as a rule, do the largest corporations have the highest rates of return on net worth, and this is really a function of their relative stability. Their decline is slower than that of the small firms; that is, the large businesses do not actually make a good showing at such times, but merely do not have such a bad comparative record.

For adequate analysis of profitability, income and no-income corporations must be separated, as the averaging of these groups conceals important differences. Separate treatment shows that, in general, both the rate of profit for the income corporations and the rate of loss suffered by no-income corporations vary inversely with size. Which size group is the most profitable depends to a considerable degree on the proportion of corporations of each size which falls in the no-income category. During the shift from depression to prosperity, the percentage of unprofitable small firms decreases the most rapidly and the most profitable over-all size likewise declines.

The use of averages is more satisfactory for dealing with the large than the small corporations because of the wide dispersion of incomes or losses of the latter. The most profitable of the small firms enjoy an extraordinary return on net worth, but the losses of the unsuccessful eat up a major portion of their investment.

Why the Largest Corporations Appear Less Profitable

A large corporation tends to balance profits and losses. It is in reality carrying its own business insurance. As one field of activity recedes and disappears new products are introduced. This means that the profits over a period of years will be lessened by the costs of the new experimental products but the corporate entity is more likely to continue from year to year. We do not really know how much the individual corporation or society can afford to pay for this insurance, but it is certainly valuable to the individual stockholder of the enterprise. For him the rate of profit is a little lower, but the certainty of its receipt may well compensate adequately for this somewhat smaller return.

Another primary reason why the large corporations have lower rates of profit is the stage of maturity they have reached. They tend to approach the end of an expansion process. This is illustrated by the lower proportion of the total market which is now supplied by the Great Atlantic and Pacific Tea Company and the United States Steel Corporation, as compared with their share in the past. The more rapidly expanding medium-sized firms are more profitable in part because they are expanding. When they come to the end of that expansion period their profits also will be at a lower rate. Industry as a whole has a higher rate of profit when expansion is going on. The medium-sized firms are in their expansion stage, but the largest have passed through that stage and have developed the traditional conservatism of age and large size.

The motives to further expansion and greater profits decline as a firm grows larger. If a corporation is first in size there is little reason to attempt to grow larger, and stability becomes more important than new profit potentials. The economic motives to expand become less important. Nor is there any longer a reason to speculate or take special risks; just as an older person acquires conservatism, so such corporations acquire similar characteristics. Moreover, in their role as industry leaders they may need to refrain from certain practices which some of the smaller firms use to increase their share of the business.

As a firm grows larger, its increasing conservatism is indicated by changes in its financial structure. Instead of borrowing to a greater degree, which could be done profitably and with less risk than would exist for smaller businesses, it reinvests earnings or obtains more equity capital through the sale of additional stock. There is no inducement for the management to risk its vested interest by assuming the added responsibility attached to bond issues and fixed charges.

There are the further questions: could large-scale businesses be more profitable than they actually are, and what inducement do they have to increase their profitability? Undoubtedly the major firms either control or at least exert a principal influence on the price structures for their industries and could increase their profits through reducing costs, maintaining higher prices, and using borrowed funds to a greater degree. But the complications which would develop therefrom may discourage their attempt to obtain the highest possible returns. They must think in terms of long-range plans and programs; immediate advantage may be of little consequence. During the immediate postwar period, for example, the three major automobile manufacturers could have charged much higher prices for their cars, gaining the temporary advantage which accrued to the "new used car" dealers, but they did not choose to do so. Kaiser-Frazer, on the other hand, being a new company without established precedent, took advantage of the higher prices to get a start in the automobile field.

The complications which may arise when the leader in a field is especially profitable are currently illustrated by General Motors Corporation. Its high dollar income for 1949 has been widely publicized, with little or no comment on the rate of return on net worth either on an absolute basis or in comparison with competitors. If the company lowered its prices (and it has the highest dollar profit per car), it would squeeze the less profitable firms in the field and bring criticism from and an investigation by the Federal Trade Commission, Because of its high income some Congressional committee might investigate the industry, and higher corporate income taxes have been mentioned. If it raised wages this would set a pattern for the industry and would also bring further pressure on the less integrated producers with higher costs of manufacture. Through its new five-year program providing for wage increases and more liberal pensions, the company has apparently chosen this latter alternative.

Large Corporations Reflect Trends in Modern Industry

Much of the argument against bigness, although supposedly based on the issues of relative efficiency and profitability, as well as upon the many questionable practices of large corporations, has not really stemmed directly from any of these, but has reflected instead either an enthusiasm for small, locally owned business or a fear of the social or political consequences of too great a concentration of economic power.

There is some reason to doubt that the Federal Trade Commission, for example, is particularly interested in either relative efficiency or profitability. It seems more concerned with limitation of industrial corporations to a size that will be easier to control as to competitive practices, in accord with the philosophy of a small-business economy. Certainly, the concern for relief of small competitors appears to be the dominating influence.

A major argument against large-scale business, and one which seems to permeate much of the philosophy of the Federal Trade Commission and the Antitrust Division of the Department of Justice, is that large-scale units which control a sufficient proportion of the market to exercise monopoly power should be broken up regardless of their efficiency or profitability. Even though they may be the most efficient, the social and economic disadvantages arising from the actual or potential monopolies are deemed to be so great as to require their elimination as a menace to society. What if efficiency and profitability were reduced? Prices to the consumer, under conditions of competition, would probably be at least as low, even with the reduced efficiency. This point of view keeps alive the old notion of an economic system in which there is vigorous price competition among a large group of small independent units.

Under present conditions of collective action and growth, both national and international, is it wise to attempt the reconstruction of a system of small business? Little appears likely to be accomplished thereby, aside from the political prestige gained by certain persons in pleading for the "small man." Placing small business on a pedestal has been a fetish in our economy for certain groups (including some economists) but, if taken seriously, it would be detrimental to an understanding of the issues involved. Our economic society should be concerned with the most effective method of handling large-scale units, and not with determining how to make them smaller and less efficient units, in a reversal of the historical and world-wide trend toward collective action. Economic theory applicable to small-scale units always operated in a somewhat rarefied atmosphere, but the vacuum has now become rather complete. Regardless of what may happen under certain circumstances, such events have little significance if they are divorced from present and future reality. Even if the theory may have represented an approximate explanation at one time, it no longer does so and is not likely to become more realistic in the future.

From the foregoing conclusions with regard to the necessary significance of large-scale operation it follows that proposed reductions in the size of corporations would certainly not reduce them to the category of small business. And yet the philosophy of "reductionism" still clings to the outmoded notion of an automatically operating system in which price adjustments create instability for the small-scale individual business but result in a stable equilibrium for society as a whole.

Without entering further into the endless argument as to whether stability was actually created—or could be created—by such a process, it is evident that such flexibility is not compatible with large-scale firms. Nor does our economic theory of competition among small corporations, which treats the operations of oligopoly and monopoly as deviations from the normal condition, afford a satisfactory explanation for current economic behavior.

For many years after it became evident that extensive competition among railroads would be ruinous in nature, Congress still tried to enforce as much competition as possible. In trying to break up large-scale business units the Federal Trade Commission, the Department of Justice, and many economists may likewise be trying to hold back what appears to be an almost certain development. It might well be preferable to recognize the essential primary significance of large-scale business and the relative insignificance of small-scale operations, and then decide how to keep the large-scale corporations from following practices which are opposed to the public interest. Although recent analysis of big government has shown innumerable inefficiencies, the suggested remedy has not been one of demolition into segmented units as is suggested for giant business; rather, more intelligent organization and administration are suggested for a continuing entity of mammoth proportions.

If it is finally determined that, by one method or another, the largest firms in various fields should be reduced in size, then the probable results must be studied not in terms of fifty small firms operating under perfect competition but in terms of not more than half a dozen large firms operating under conditions of oligopolistic competition. It is futile to envision for industry what might possibly have existed if different antitrust laws had been rigorously enforced during the past fifty years.

As was the case with efficiency, further analysis of profitability by size of firm is desirable before any final conclusion can be reached with respect to the effect on profits of a change in size. The answer will hinge not only on the relative efficiency of firms of different size but also on many political and economic considerations.

As a prerequisite to any program with regard to the ideal size of corporations the basic aims of our economic system should be determined. While we have continued to give lip service to a system of individual free enterprise, our actions have shown an increasing acceptance of and dependence upon collective action. This can be illustrated by numerous examples. College graduates, for instance, ordinarily think in terms of employment in a large business organization rather than of starting their own business. Farmers have given up part of their individualism for subsidies. Centralization and collective action are everywhere replacing individual choice and action — in our search for higher incomes, security, and full employment. Recent elections for both national and state offices have reflected the trend of public thought indicating an increasing acceptance of those governmental functions which reduce freedom of action and individual initiative of the type that we at least imagined were ours. We move in the direction of collectivism, probably not even realizing that, if big business is actually inefficient in private hands because of its size, the results in this regard would almost certainly not be improved if government-owned business of still larger magnitude should replace our existing economy.

A final point might be considered. It is all too possible that efficiency and profitability may become rather insignificant in future determinations of the maximum allowable size of business corporations. Such matters can very easily be subordinated to other economically less important considerations in bargaining procedures between large corporations, giant unions, and big government. During the postwar period, government pressure was being applied to induce the largest units in the steel industry to expand their capacity, and the unions were demanding that the government should assume this responsibility if private industry refused. This was during the same period when a government agency was investigating the allegation that the major steel companies were already too large. The high postwar consumer demand

and the requirements of the armed services also encouraged expansion of the facilities of corporations of all sizes.

In the long run the evolving combination of pressure groupings will change our economy in ways which cannot be forecast with accuracy, but it appears unlikely that the sporadic efforts to decrease the maximum size of manufacturing corporations will prove successful. A more plausible conclusion might be that the conflict of diverse pressures will cause further expansion resulting in corporate entities of sti[illegible] size.